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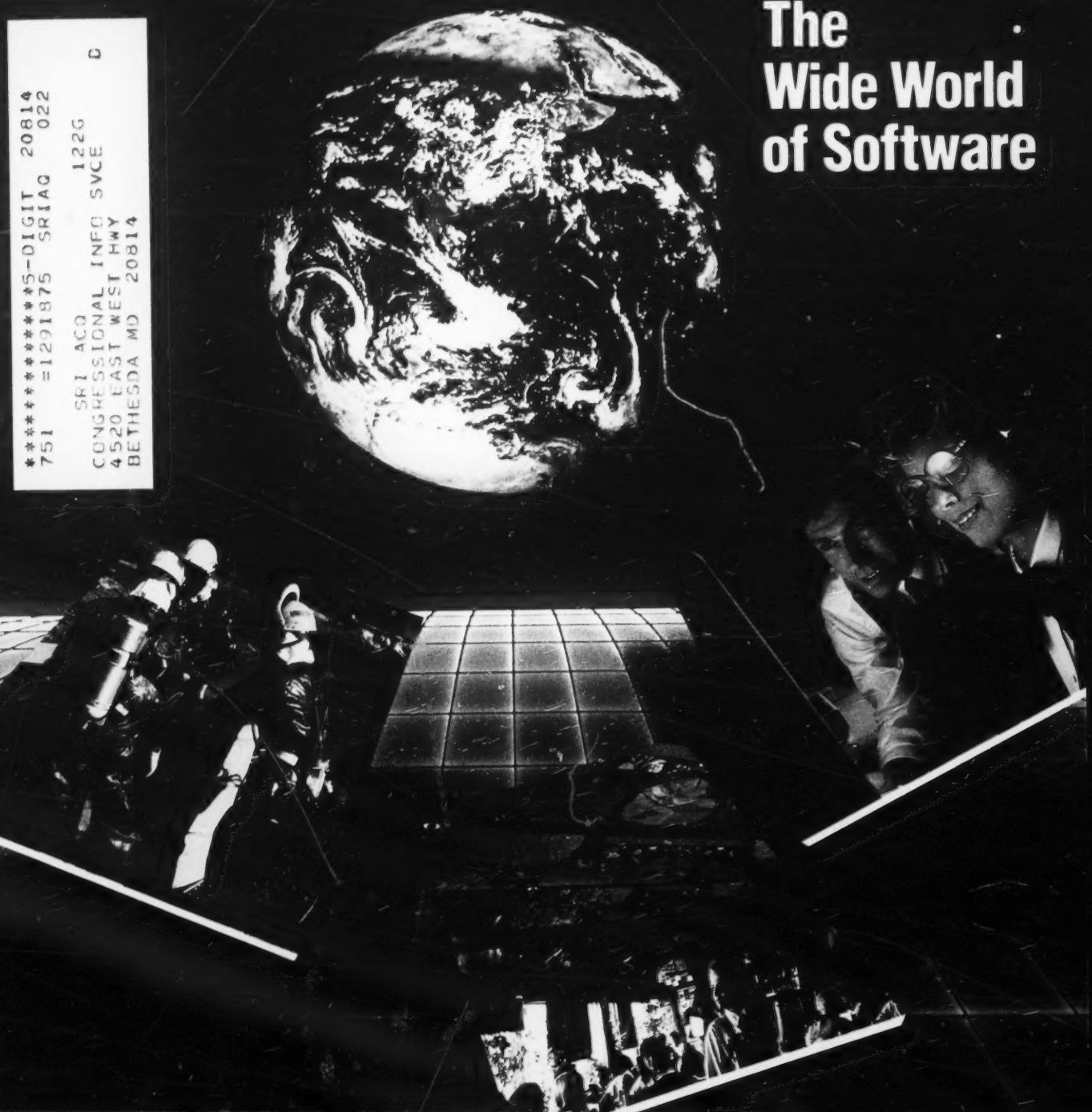

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Circulation
Group Circulation Manager: Ellen Cowles
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Editorial Offices
Headquarters: Hitchcock Building
Wheaton, IL 60188; (312) 665-1000
110 Fulton St.
Boston, MA 02109; (617) 723-8970
1021 S. Wolfe Rd., Suite 275
Sunnyvale, CA 94086; (408) 730-0131
Jan Snyders
PO Box 187
Lockport, IL 60441; (815) 485-8962

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25W550 Geneva Rd., Wheaton, IL 60188
President, Loren M. Walsh
Phone: (312) 665-1000 Cable: HITCHPUB
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■ *Arnold E. Keller*
Founding Editor, Group Publisher

■ ***It would be foolhardy to think IS would be immune to cutback fever. In some cases, an IS cutback may be a blessing in disguise.***

Will IS Feel The Axe?

Call it what you will—reorganization, job trimming, fat cutting—the movement to get rid of people seems to be the top item on management's agenda, regardless of the long-term consequences.

As the year-end issue of the *Research Institute Report* states: "Auto industry, over the next five years, plans to chop 120,000 more jobs from a 900,000 workforce. GM is laying off 29,000 workers on top of a scheduled 35,000 white collar cut. AT&T is eliminating 50,000 jobs. Other big industries are following their lead." You can be certain the contagion won't be confined just to big industries.

It would be foolhardy to think that the information systems (IS) operation would be immune to cutback fever, even though information is perhaps the key resource in helping top management cope in a competitive environment. In some cases, an IS cutback may be a blessing in disguise: allowing the write off of some programs that probably never should have been started in the first place, cutting off some backlogs that will have little or no effect on the future of the enterprise.

At any rate, it would be well for IS management to beat the bean counters to the punch by providing its own program for cutbacks and detailing the cost savings and the results such savings would have on the firm's information system. The IS analysis, if factual, might deter any hasty axe wielding by top management.

On a brighter note is a report from Nationwide Recruitment Professionals on the 1987 high-tech job and salary outlook. This survey of leading US recruitment professionals indicates that in the computer and data processing fields, 1987's highest-demand specialists will include systems programmers, systems analysts, network planners and engineers, and microcomputer specialists. Among the industry groups that will set the pace in computer-related hiring are banking/insurance/financial, communications and various service and manufacturing industries.

Following is the report's 1987 salary outlook for selected titles in the computer field.

	Projected US Median Salary	Projected US Average Salary Range
Director/computer/data processing	$66,100	$52,000-$77,300
Systems/programming technical services manager	55,200	45,000- 71,700
Data base administrator	49,250	39,300- 56,000
Sr. systems analyst (7+ yrs. experience)	43,700	37,200- 55,000
Computer project leader	41,916	36,300- 48,650
Sr. programmer/analyst (7+ yrs. experience)	40,150	33,200- 45,700
Software engineer (2-6 yrs. experience)	39,100	30,350- 47,000
Data base analyst (2-6 yrs. experience)	34,750	28,100- 43,200
Staff programmer (2-6 yrs. experience)	32,600	24,900- 40,300
Entry-level BS/computer science	27,100	23,400- 30,800

Source: Dowden & Co. "1987 High-Tech Salary Outlook."

Arnie

The Way to Handle Electronic Messages

An electronic message handling system (EMHS) based on the X.400 standard can optimize revenue generation and return on investment.

By Donald E. Ross, Program Manager
International Telemail Systems
GTE Telenet Communications, Reston, VA

Electronic message handling systems (EMHSs) can make or break your organization. An immediate response to this statement most probably would be, "That's absurd," followed by, "What is an electronic message handling system?" In the truest sense of the words, an EMHS provides for transmission of voice, text or data between two entities using terminal, telephonic or computer facilities.

More and more information systems (IS) managers are being asked to provide high-tech means of capturing and disseminating accurate and timely information. Often, these solutions are more costly than the benefit derived, and require extremely long implementation schedules. Unfortunately, by the time the information system is deployed, in many cases the configuration has become archaic and no longer meets the need.

In an environment of ever-changing technology, today's decision can easily become tomorrow's folly. In the selection of what is truly needed to support management's decision-making process, IS managers can easily be dissuaded by budget constraints and the urgency of the situation from the best solution. It is of paramount importance to always maintain not only the vision of today's needs, but the future's as well.

Issues involved in selection of appropriate communications resources and facilities are extremely varied. In the past, total reliance on land lines was the order of the day. As long as protocols and equipment were identical at each end of the communication link, the iterative process could occur. This method was cumbersome, unreliable and costly. Fortunately, however, advances in the last 10 to 15 years allow different equipment types to be used with high-speed trunk lines, X.25 packet-switching networks (both public and private), microwave and satellite links, shared bandwidth and fiber optics.

But all these capabilities are still not enough. Questions arise relating to what is the best solution: equipment, applications or both? What is the best approach: distributed or centralized systems or a combination? Logic dictates that the type of system (network) selected is relative to the needs and logistics of the business. Therefore, the primary concerns are cost-effectiveness, reliability and service to the user.

A most effective means of addressing these concerns is a telecommunications protocol called the CCITT X.400 standard. This standard provides for an overlay of the X.400 protocol on the existing X.25 packet-switching network. It defines the system model and service elements, as well as seven other layers for information exchange among users, microcomputers and mainframe computers.

Figure 1.

X.400 Series Recommendations

- X.400 — System model and service elements
- X.401 — Basic service elements and optional user interfaces
- X.408 — Encoded information-type conversion rules
- X.409 — Presentation transfer syntax and notation
- X.410 — Remote operations and reliable transfer system
- X.411 — Message transfer layer
- X.420 — Interpersonal messaging user-agent layer
- X.430 — Access protocol for teletex terminals

Working with the model shown in Figure 1, members of the CCITT X.400 study group are combining existing protocols such as telex, teletex, facsimile, binary data structures and electronic mail systems. Formal approval of the X.400 standard was granted at the CCITT plenary session last October.

Approval of X.400 means IS managers can satisfy corporate management's need for information in a more viable and cost-effective manner through the use of X.25 packet-switching networks, micros, inexpensive terminals and X.400-based EMHSs. IS managers can start planning the specific criteria needed to implement an EMHS uniquely tailored to their corporation's requirements.

Even though messaging systems such as telex and TWX may be considered dying, all viable messaging systems now in use both domestically and internationally must be combined. This will be necessary for at least the next eight to 10 years.

Through the advent of public and private X.25 packet-switching networks, telex conversion is currently accomplished with hardware and software utilities. Converted transmissions are then passed through international gateway points to and from the US. This is hardly sufficient for the need. In addition to a conversion from BAUDOT to RS232, speed conversion is also required. Telex transmits at 50 bits per second (bps) and teletex at 110 bps. Without buffering and speed conversion, it is impossible to consider interworking these communications methods.

Significant opportunites for enhanced communication capabilities are possible, however, by in-bound trunking to EMHSs at rates of at least

9,600 bps. Also creating opportunities is the high-speed storage and forwarding of significant numbers of messages by the international record carriers such as Western Union, RCA Global Communications, ITT and others. With additional store-and-forward capabilities contained in an EMHS, data and information can be trunked via networks at rates of 56,000 bps or even at T1 carrier speeds of over one million bps.

Transborder data flow. Regulation of transborder data flow by multinational organizations is being performed by the private sector. Working with government regulatory agencies and special committees established specifically to study the issues, the private sector is also thoroughly involved in the analysis of all issues concerning transborder data flow. Primary emphasis is being placed on privacy, security, unrestricted information flow and economic impacts.

Foreign countries such as France, Germany, the United Kingdom, China and Japan view things from a different perspective. In these countries, restrictive regulations apply which might prevent unconstrained flow of information. In common practice, however, multinational corporations conforming to local regulations rarely experience any difficulties in daily business communications.

Conforming to local regulations can become costly in such countries as Germany if systems are not implemented properly. Regulatory bodies there have decreed that data flowing out of that country must have been processed on an in-country computer. This means the multinational organization involved must either install a computer facility in that country or contract for capacity on an existing in-country resource.

Although it may appear that some foreign countries are setting themselves up to restrict transborder data flow, the reality is that they feel the need to protect their national interests from exploitation. To do so, they are attempting to impose technical, economic and bureaucratic conditions on foreign services and information exports. IS managers tasked with deployment of communications networks crossing international boundaries must make themselves aware of existing regulations and act accordingly within the system.

When dealing with a foreign public telephone and telecommunications organization, costs for equipment, telephone lines and overall administration must be planned for. Modifications to existing in-house systems have to be made to accommodate the additional functionality and subsequent accounting and report functions. These can be significant budget and staffing issues. Accordingly, multiple levels of management awareness and support are mandatory. Information on the average message costs for domestic and international messaging are shown in Figure 2.

Figure 2.

Average Cost of Electronic Mail Messages

Messages per month	Domestic message cost	International message cost
In-house*		
More than 1,000	$0.05-0.07	$0.15-0.21
500 to 1,000	$0.10-0.20	$0.30-0.60
100 to 500	$0.20-0.35	$0.60-1.05
Less than 100	$0.35-1.00	$1.05-3.00
Public service	$0.50-1.00	$1.25-5.00

*These charges are for transmission only; they do not include system start-up. Number is in thousands.

Source: Office Information Systems publication (January 25, 1986), "Electronic Mail: An Analysis of Options for the Office."

IS in the hot seat. What has all this to do with the CCITT X.400 standard and the role of an organization's IS manager? The answer is everything. The basic responsibility for communications was most likely levied on the IS manager for marketing, cost-saving and revenue-generating reasons. From the perspective of cost-effectiveness and return on investment, the IS manager is on the hot seat and must find a communications solution. An X.400 EMHS can be the answer to the problem, depending on volume and timing requirements.

EMHSs can be acquired almost off the shelf from most vendors. A system must be slightly tailored to an organization's specific needs, but this is a short modification and deployment cycle. The maximum time from start of the procurement cycle to operational capability varies from one to six months, depending on what unique features are required. If the organization already uses one of the EMHS-based systems (Prime or Tandem, for example), operational readiness time would be shortened significantly. Additionally, it would negate any requirement for substantial training of management, operation and maintenance staff, and probably reduce hardware upgrade needs.

Some notable organizations that have serious commitment to the X.400 effort are: CompuServe (InfoPlex), General Electric Information Services Co. (Quick-Comm), GTE Telenet (Telemail), McDonnell Douglas (OnTyme), MCI Telecommunications (MCI Mail and Mail-Com), RCA Global Communications (RCA Mail), Western Union (EasyLink) and ITT (Dialcom). ITT and British Telecom are currently conducting negotiations for the latter to acquire the Dialcom product.

If your company is multinational, an X.400 EMHS can be the answer to your transborder data communications needs. But whether your company crosses borders or not, X.400 can provide the requisite cost-effective solution, ease of use with minimum of training and increased revenues through the use of cost-saving networking considerations. The capability is available, the technology is good, and the IS manager need only avail him- or herself of the opportunity to succeed. (IS)

Planning Checklist

Planning is essential to ensure any electronic message handling system (EMHS) meets company needs. A checklist of questions, such as the following, should be circulated throughout the organization to determine requirements.

- What is the potential number of users?
- What method of communication is currently used?
- What is the average message length?
- How time-sensitive are the messages?
- Do all users require terminals or micros?
- What is the projected volume of messages?
- What type of traffic is anticipated: domestic, international?
- Is the existing terminal population adequate for an EMHS?
- What is the makeup of the user population: computer novices or experts? (IS)

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Programmer Productivity Tools:

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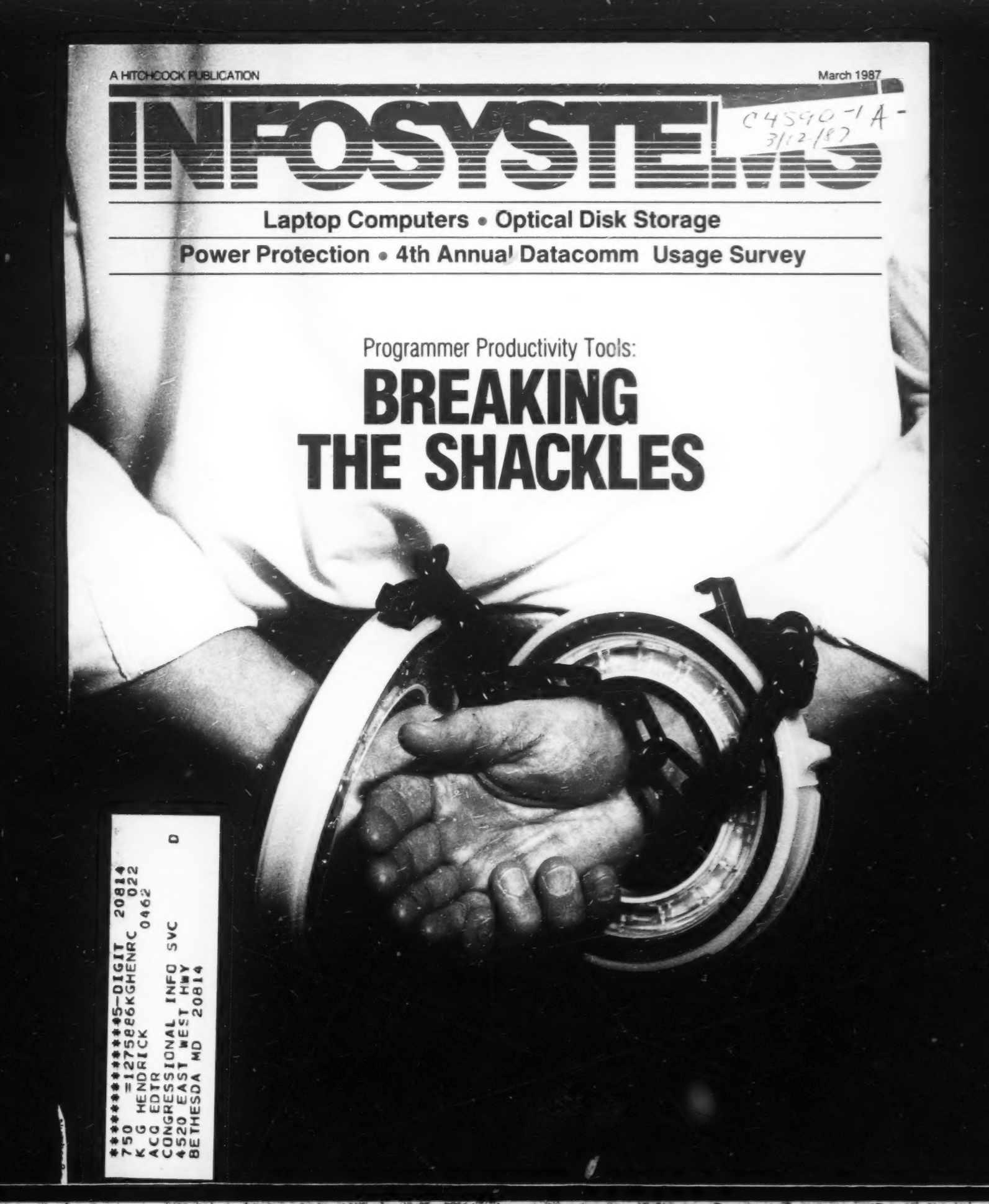

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Wayne L. Rhodes, Jr.

Founding Editor & Group Publisher
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Senior Editors
East: David H. Freedman
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The Diebold Group, Inc.
New York, NY

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Editorial Director
Auerbach Publishers, Inc.
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Robert E. Johnston
Director, Data Processing
Phoenix Mutual Life Insurance Co.
Hartford, CT

Circulation
Group Circulation Manager: Elen Cowles
Circulation Supervisor: Carol Tratar
Asst. Circulation Supervisor: Karen Johnson

Editorial Offices
Headquarters: Hitchcock Building
Wheaton, IL 60188, (312) 665-1000
110 Fulton St.
Boston, MA 02109, (617) 723-8970
1021 S. Wolfe Rd., Suite 275
Sunnyvale, CA 94086, (408) 730-0131
Jan Snyders
PO Box 187
Lockport, IL 60441, (815) 485-8962

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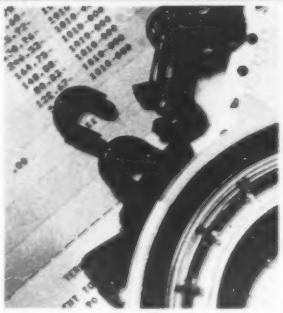

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PROGRAMMER PRODUCTIVITY TOOLS: Breaking the Shackles

Some programmers spend hours laboriously producing code when a few simple tools could release them from their fetters.

■ By Jan Snyders, Senior Editor

Pity the poor programmer: sitting at a terminal from before sun up until the early hours of the next morning; developing, enhancing, modifying programs. More specifically, pity the poor programmer who is unaware of productivity aids. Those individuals are often prisoners of their job, spending hours laboriously producing code when a few simple tools could release them from their fetters.

The size of the potential productivity increase depends on the comprehensiveness of the tools chosen. About 100 different tools are on the market, ranging from a complete development center to workbenches to simple documentation aids. Increase productivity at any stage, and the entire programming cycle is accelerated. Increase productivity at a number of integrated stages, and productivity gains are more substantial.

To aid the development process, for example, Dadsco in Dayton, OH, installed QuickTask from Goal Systems International, Columbus, OH. "Development time is about 65 percent less than that required by CICS command-level programming and 95 percent less for systems programmers," says Rick Schwartz, president of Dadsco. QuickTask functions as both a utility and as a stand-alone application-development aid replacing command-level Cobol.

Other users report substantial increases as well. A Minnesota-based service bureau reduced coding time by about 30 percent using Sourcemanager from MSP, Lexington, MA. One manufacturing firm installed two online development aids and increased programmer productivity 80 percent

over CICS capabilities.

These and other increases are possible given the range of productivity tools available. A look at the uses of these tools--and their benefits beyond raw productivity figures—shows the variety of ways programmers are breaking the shackles.

"We were not adequately responding to our customers," says Dadsco's Schwartz, whose firm provides computer-based management services to wholesale supply houses. "Response time to customers was really key to our survival. The response time in development of new systems and enhancements to current systems was not adequate using Cobol command-level CICS development practices and procedures."

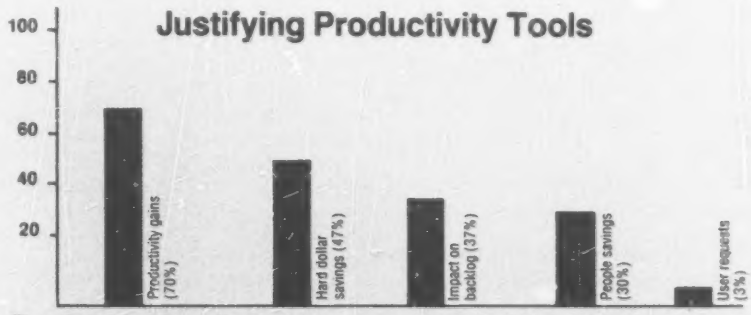
Dadsco's staff of seven programmers uses QuickTask to develop inquiries to file maintenance programs and inventory, financial and order-entry data bases. The staff also employs it as an on-line problem determination and fix program like a batch utility.

In addition to the development time savings mentioned, Schwartz provides good figures on other productivity increases. "When the program is in a debug mode, there is a reduction of 50 percent in debug and test time over programming without QuickTask," he says. "So we get another 25 percent savings in screen design and about 25 percent in the coding itself."

The Help facility built into the product is particularly suited for entry-level programmers, according to Schwartz. It allows them to get help in a specific area or language. Examples and instructions for a particular portion of the language appear on the screen so the programmer doesn't have to look for the reference manual. "This has been helpful not only in getting consistency in the coding," he says, "but it also speeds up the coding itself. The programmers can't remember everything, but they don't have to get up and look for the information."

Sometimes productivity increases on a larger scale are necessary. At the US General Services Administration (GSA) in Falls Church, VA, Richard Harrison, director of the Federal Software Management Support Center, has set up a programmer's workbench (PWB) using the Rand Development Center (RDC) from Rand Information Systems, Alameda, CA. "The center was set up specifically to develop information, methods and techniques for other agencies," says Harrison. "We sell our services and are what is known as a demand-justified, totally reimbursable operation."

GSA started by handling two functions on a common basis for other agencies: validation of compilers and conversion. Several years ago a lot of change took place in the federal government. Conversion was occurring frequently. It was approached in every possible way, both technically and contractually, Harrison recalls. "At that time, software productivity tools were not an issue with us," he says. As clients started asking for more assistance in solving problems, "we found ourselves developing guidelines, tool selection and evaluation [procedures] on a case-by-case basis. We were reinventing the wheel each and every time. That was getting expensive.



The primary question managers must answer is: How much more can I accomplish without increasing my staff? Once that is identified, productivity gains are translated into profit and loss impact (such as cost avoidance or cost savings) to justify the decision.

Source: Dialogic Systems

"We set out to assemble an inventory of productivity tools that we thought would be capable of increasing productivity and reducing cost in our maintenance functions."

GSA settled on IBM hardware because more software tools were available. "The software tool we envisioned would control all the other tools," says Harrison. "We searched for a long time trying to find control. The only thing we were able to come up with in this country that met the specifications was RDC. There were two others but both were hardware driven and we wanted to use our own equipment."

Once RDC was selected, it was necessary to develop a list of software that would run under the PWB. GSA chose 11 functions that would be reasonable for use and specified performance for each. The 11 subsequent tools came from eight vendors.

GSA's Federal Software Management Support Center provides other government agencies with handbooks and brochures containing information about the PWB. Users can buy as much of the service as they want. "We will sell them individual tools for any number of reasons," says Harrison.

In every case where GSA has sold a tool to federal clients without them buying a PWB first, they have come back and bought the PWB. That's because they realize how great it is, asserts Harrison. "Intentionally, the use of tools stresses integrated configuration," he says. "But in the long run, it would have been silly to put a policy out that said you can only buy this package and nothing else. We would have been slamming the door on potential customers who may have come back and purchased quite a bit."

The Rand products used by GSA are an example of a comprehensive, integrated set of tools designed to increase applications-development and maintenance productivity. "The design goals inherent in the RDC productivity aids enhance control of software development and support functions, and increase the quality of applications software," declares Christopher Ehemann, product manager at Rand. "RDC establishes an environment where productivity tools and procedures are supported by interactive, user-friendly dialogues. It provides a controlled and uniform interface for presentation of software tools, utilities and productivity aids. It also enhances user participation in design, testing activities and organizational procedures."

RDC consists of six major component groups: Systems Software Manager (SSM); IDMS applications-development tools; IDMS application-

testing tools; IMS and CICS applications tools; and Software Maintenance Utilities (SMU). SSM provides the umbrella or infrastructure for the organization of all tool sets into workbenches or related groups.

A General Information Facility or bulletin board and a JCL-generation facility enhance usability and expandability of the development center. The IDMS, CICS and IMS application tool sets support system-development activities including dictionary interface and program generation. Automated support for an exacting testing methodology is also provided. The IDMS development and testing tool sets may be acquired together as a package or separately, depending on user requirements.

The CICS and IMS application tool sets rely heavily on a common facility called the Rand Development Dictionary. This generates application-system components such as screen-control blocks and program-copy structures. Similar tools support design and testing activities and data base maintenance. Both tool sets have a full-function, on-line systems architecture to support complete applications program development.

The SMU set provides individually available tools under the SSM which supports software maintenance activities. These activities include system source-code cross-referencing, source-code reformatting, unreferenced source-code analysis, test results verification, percentage-of-execution analysis, and test data extraction and conversion.

A major RDC feature is its modularity. "The infrastructure alone, the SSM which includes the JCL-generation facility, and some program-generation capabilities for developing new tools can be purchased for about $30,000," says Ehemann. "If you acquire what we call an application-development tool set for IDMS, IMS or CICS, it includes the SSM, all the JCL-generation, program-generation and testing facilities, and change-control tracking facilities. That can cost up to $87,000."

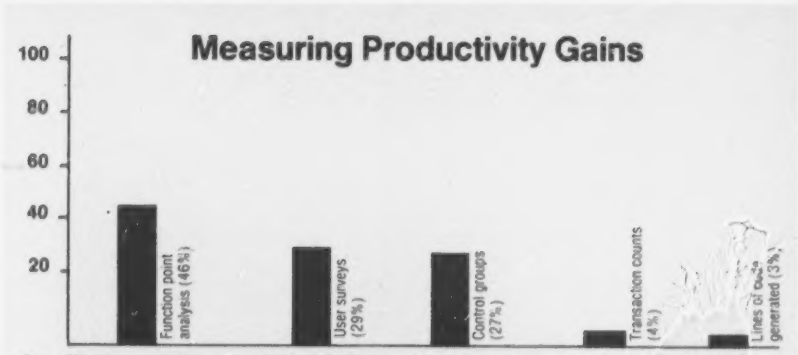
National-Standard in Niles, MI, also reports increased productivity after installing programmer productivity software. The company, an international wire manufacturer that supplies metal fabricating shops with weld and spring wire, faced a large backlog for on-line development. "At the time we were strictly using CICS. [We also] had budget and personnel cuts, and had to let people go. That complicated the backlog problem," says Priscilla Davis, systems analyst.

In order to solve the problem, the company installed UFO and Cobol XE from On-Line Software International, Fort Lee, NJ. Programmers and programmer analysts use these packages for all on-line development. "Programmer productivity has increased approximately 80 percent over what they were capable of doing using CICS," says Davis.

National-Standard developed a massive system: 30 to 60 screens including batch reports and all the analytical work. Because of the increased productivity, it was up within six month's time using only 1½ to 2 people, Davis says.

Instead of a looming backlog, one service bureau used the conversion of mainframe hardware as the impetus for installing productivity tools. Medical Data Reports (MDR), West St. Paul, MN, realized a 30 percent gain after installing Sourcemanager from MSP, Lexington, MA. MDR, a service bureau specializing in debt collection, encountered a problem when it decided to convert mainframe hardware vendors from Sperry to IBM. "Along with that technology change, we had to retrain a lot of people and staff up with new people that had more IBM experience," says Kevin Dinger, manager of technical support.

MDR basically redesigned its entire data processing shop, not wanting to just convert the old system to new. "We wanted to redesign and redevelop, which was a good size project for our company," says Dinger. "We also decided that we were going to start a more regimented way of designing and implementing systems."



Only 69 percent of the survey respondents answered the question about measuring productivity. The results of those who did show that the old mainstay measurements of the 1970s—lines of code generated and transaction counts—have fallen to the wayside in favor of more quantifiable methods such as function point analysis and control groups.

Source: Dialogic Systems

A Survey of Management

While large amounts are spent on software tools for new development, 68 percent of information systems (IS) managers polled in a recent survey said productivity tools used for program maintenance provided the highest returns.

These findings come from a survey of 149 managers of IBM MVS installations from across the US with staff sizes ranging from 25 to 800 programmers. The survey was conducted by Dialogic Systems, San Jose, CA, in conjunction with a series of productivity planning seminars. The charts shown throughout this article are from the survey.

Regarding improved maintenance productivity, managers said maintenance tasks such as program fixes and package modifications can account for anywhere from 55 to 95 percent of their real workload. Although productivity gains in the maintenance area were said to give the most benefit, most managers indicated that their past purchases have predominately been for Cobol and application generators for new development only.

The survey also revealed that 70 percent of the managers found changes to their programmer environment had the most significant impact on productivity. Changes mentioned include consistent response time, one-to-one terminal ratios and the installation of ISPF. Only 30 percent said software tool purchases such as fourth-generation languages and report writers provided a greater benefit. (15)

For more information on the survey, Enter No. 14 on the Reader Information Card.

PROGRAMMER PRODUCTIVITY TOOLS

Dinger says the company looked at code generators but decided they did not fill the bill. One of MDR's goals was to market the redesigned system to other companies. "We wanted that code to look good to other people both visually and performancewise," he explains. "We wanted code to be consistent so that maintenance was a much easier task."

Sourcemanager is tied closely to a data dictionary and data manager. "We are not a data base shop yet," says Dinger "We needed a product that generated Cobol but was not tied to any particular data base methodology. We are using [Sourcemanager] strictly to generate Cobol, not any particular type of Cobol or type of data base attached to Cobol, but just generating the Cobol code."

The Sourcemanager generates about half of the program or the first three divisions of a Cobol program: the environment, identification and data divisions. Those areas of the program are repetitious, but quite time-consuming if a programmer has to code them. "Now programmers can spend the bulk of their coding time coding the procedure division, which is what they are paid to do," says Dinger.

In addition to saving on coding time, companies can gain in other ways. For instance, General Foods, Lafayette, IN, reduced staff after installing Manage/38 from BMS, Oak Brook, IL. According to Wayne Hilt, senior systems analyst and operations supervisor for the food manufacturing and distribution company, the primary reason for looking for new software was to solve the night-shift backup problem.

"It was difficult to attract and keep good-quality people on the third shift," says Hilt. "When we found the package to solve that problem, we found it had other benefits, such as being able to better coordinate and control program development, and better utilization of job logs."

Priscilla Davis, Systems Analyst
National-Standard, Niles, MI

"Programmer productivity has increased approximately 80 percent over what they were capable of doing using CICS."

Manage/38 is used as a job-log management system. Now if a programmer has to find a job log, it is searched for by job, user, or time. That makes it easy to find. Under the old system job logs were printed by day and filed in a vault, making it cumbersome to locate what you wanted.

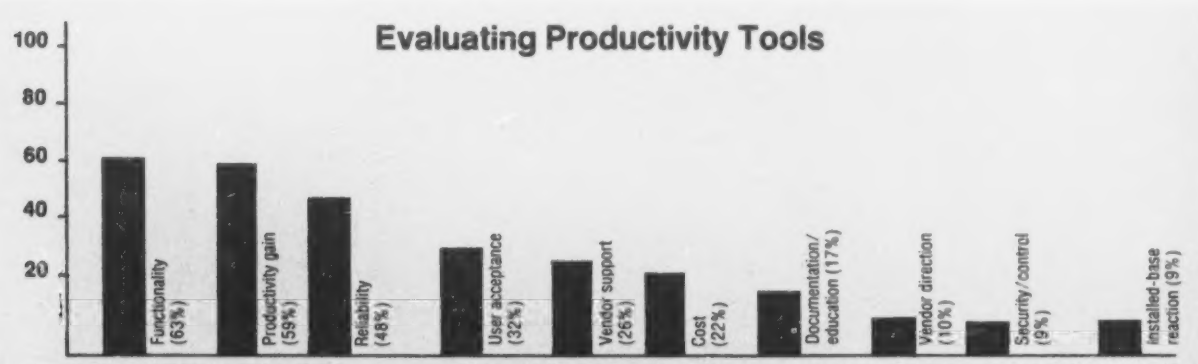
The system is also used for automatic job submission. "We have several jobs that we run every day," Hilt says. "We just schedule those jobs at whatever time we want them to run. Then, when that time comes around, the job is automatically executed."

Hilt mentions other benefits. "We have better control over program development," he says. "We know exactly what phase that the particular program is in, whether it has been put into production or where it is in the process. We were able to reduce operations staff since installing the package. We have also found that users can generate their own on-line Help tactics rather than have systems people generate and write them in systems terminology."

In addition to saving time, another way to judge the benefits of a software package is by the length of time it takes to pay for itself. Commerce General, Memphis, TN, is a subsidiary of the National Bank of Commerce that does financial data accounting. Before installing Condor from Phoenix Software, Los Angeles, it had a card data-entry system for updating source modules. The company needed much faster turnaround and got it because Condor is an on-line system.

"You [shouldn't] have a data-entry department where you have to wait a day or a day and a half to get source code changes back from the keypunch area," says William Burgett, vice president of systems at Commerce General. With Condor, the programmers all have their own terminals and everything is entered on-line, greatly improving productivity. As for the monetary payback, Burgett says, "We really have not put a cost estimate on savings but we figured it paid for itself in two weeks." (15)

For a list of programmer productivity aid software products, their vendors and the equipment they run on, enter No. 13 on the Reader Information Card.



The top four justification criteria for evaluating productivity tools address four key questions: Does the solution actually address the problems in my workload that I need help with? Does the gain in accuracy and speed cost-justify the purchase? Is the reliability, availability and service level consistent with my expectations? Am I convinced my programmers will continue to use the tool after purchase?

Source: Dialogic Systems

4th-Annual Datacomm Usage Survey

Incoherent Communications

Confusion reigns in the communications realm where companies try to build networks out of disparate parts furnished by "finger-pointing" suppliers.

By Wayne L. Rhodes Jr., Editor and Ray Winkler, Manager, Market Research

The breakup of AT&T several years ago continues to be a bone of contention among users of communications equipment and services. What was once a seemingly comprehensible nationwide communications network now apparently borders on being an incoherent mix of crossed wires. Numerous respondents to INFOSYSTEMS' fourth-annual survey of data communications usage complain about either the divestiture itself or the frustration of trying to get AT&T to cooperate with its offspring, the Regional Bell Operating Companies (RBOCs).

Most of the RBOCs are mentioned in responses to a question about problems encountered with the installation and use of datacomm equipment. No matter what you call them—the telephone company, telco, local Bell operating company—RBOCs are referred to frequently. Complaints range from the aforementioned unwillingness to cooperate

Products and Services

	Currently use	Plan to add in next 12 months
Terminals	93%	28%
Modems	94%	29%
Printers	93%	25%
Microcomputers	84%	26%
Communications software	73%	22%
Micro-to-mainframe links	60%	36%
Private line	48%	11%
Communications processors	45%	11%
Multiplexors	50%	19%
PBXs: voice	47%	5%
Carrier (common, value-added packet switching)	39%	12%
Converters (protocol interface, etc.)	41%	20%
Diagnostic and test equipment	31%	8%
Local area networks	32%	38%
Network management systems	21%	17%
PBXs: voice and data	13%	13%
PBXs: data	13%	8%
Base	878	417

Expansion Plans of Current Users (Next 12 Months)

Base: 884	Local systems	Metropolitan area systems	Long distance systems
Will expand moderately	37%	13%	21%
Will expand substantially	8%	4%	10%
Will change or replace present systems	10%	3%	6%
No changes planned or no answer	46%	80%	64%

4th-Annual Datacomm Usage Survey

to repeated condemnations of poor line quality. The following two comments are representative: "AT&T breakup is causing problems with lines and equipment to take 300 percent longer to fix." And, "The breakup of AT&T caused delay and confusion in trying to install and get four dedicated tie lines working."

The AT&T divestiture is not the only concern, however. Nearly half of the more than 900 respondents to the survey mention problems. They cite difficulty in resolving problems among multiple vendors; poor documentation; overblown sales claims; and the lack of competent technical expertise. "Equipment does not perform as advertised," writes one person. "The vendor can't decide whether the problem is hardware or software." Another complains that everything looks fine in design, but it takes a long time to make the equipment operational.

INFOSYSTEMS' fourth-annual survey of datacomm usage also indicates how various products and services are faring. For example, two years ago 55.1 percent of the respondents said they planned to add micro-to-mainframe links within the next 12 months. This year that percentage has dropped to 35.7 percent. Conversely, the number of installed links has grown significantly during the period. Where just over 40 percent had links two years ago, nearly 60 percent have them now.

A similar, although not nearly so dramatic change can be seen in the local area network (LAN) arena. Two years ago less than a fourth of the respondents had a LAN; this year almost a third have at least one. The most notable occurrence is that LANs have moved up to number one as the product or service to be added in the next 12 months, displacing micro-to-mainframe links.

Another hot technology of recent years, the microcomputer, appears to have cooled down somewhat. Two years ago, nearly 40 percent of the respondents said they would add micros within the next 12 months. This year just over a fourth say they plan to add micros. That level of expansion puts the micro in the same growth range as three long-time datacomm systems components: printers, terminals and modems.

Two years ago expansion plans were robust, but only modest expansion has actually happened. Datacomm users are being asked to make the core of what they have work more efficiently.

While the video terminal has ranked as the number one installed piece of datacomm equipment in each of the three previous surveys, modems surpass it this year. That leads to speculation that organizations may be using micros instead of terminals in some instances. Consequently, modems are accompanying the micro into installations. Modem use has grown over four percentage points in the past three years, while video terminals have fallen by just under two percent in installed base.

INFOSYSTEMS' survey was conducted during January by Hitchcock Research Services of Wheaton, IL. Respondents were drawn from the circulation of the magazine. The findings are based on responses from 23.3 percent of 4,000 mailed questionnaires. Most of the respondents say they are information systems managers. They were drawn from a cross-section of the magazine's circulation: 18.7 percent work where the entire company is at one location; 57.7 percent work at a company headquarters; and 26 percent are at a branch or division of a larger company.

Only 10 percent of the respondents say that the title of the person responsible for datacomm is the Data Communications Manager. As in past surveys, the function most frequently cited as having responsibility is Data Processing/Information Systems (DP/IS). Three-fourths of the companies report this. In those few companies that do have a Data Communications Manager, that person reports to DP/IS nearly 70 percent of the time.

As might be expected, the larger the company the more likely it is to have a formally designated datacomm manager. Likewise, the more dispersed its operations, the more likely a datacomm manager oversees the network. Thirty percent of the respondents in the transportation and banking fields report having a datacomm manager. Those are the only industries, other than DP services, to report use of the title more than 12 percent of the time.

The most frequently reported communications scheme is a local system either within a building or tying together campus facilities. Almost everyone has a local system in place. The next most frequently reported system is long distance. Over half of the respondents have one and another 9.4 percent expect to expand to that capability within the next 12 months.

Less than a third of the respondents have a metropolitan-area system in place. Not surprisingly, the heaviest use of metropolitan systems is among banks, followed by DP service organizations, and government and military installations. While most industries reported heavy use of long-distance systems, the heaviest users are transportation, DP service organizations and retail.

Types of Data Communications Systems Being Used

	Currently have	Don't have now but plan to add in next 12 months	Total that have or plan to add in next 12 months
Local systems (on-site or neighboring facilities)	83% (764)	5% (44)	88% (808)
Metropolitan area systems	31% (287)	5% (46)	36% (333)
Long distance systems	53% (491)	9% (87)	63% (578)
Total with one or more systems	96% (884)	17% (153)	98% (907)

Expansion plans among users of the various systems is modest at best. Over a third of the local-system users plan to expand moderately within the next 12 months; but 45.5 percent report no plans to change. Eight percent of the metropolitan-area users report no changes ahead; 64 percent of the long-distance users say the same.

Two years ago expansion plans were robust, but only modest expansion in the installed bases for each of the three types of systems has actually happened. It is evident that, unlike micro-to-mainframe links, little has been accomplished. Datacomm users are being asked to make the core of what they have work more efficiently. One respondent says, "Because of multivendor equipment, the diagnosing and problem determination is not integrated. We are addressing network management for the future."

The survey comments show a widespread concern about network management capability. Respondents seem to be more concerned with better management discipline and technical expertise than with getting more new equipment. There is "not one reliable source of information to put an entire network together," according to a respondent. Another decries a lack of information on what is needed on a step-by-step basis from the people who sell the equipment and software.

"The technology is running away before the system is in place," complains a respondent. "The technology is already past us." Another person describes the problem as compatibility, "tying the old to the new, to the newer, to the newest, to the future. It's not just one generation to the next, but multiple generations."

In the interim, datacomm users face a series of perplexing problems. Foremost, "there is too much finger-pointing going on when multiple vendors are used to put together a telecommunications system," says one exasperated respondent. Another declares that the problem is trying to pin down one supplier for the responsibility of downtime.

Manufacturer's specifications are not what they say, reports one user. "The water is so full of sharks," laments another. "It is hard to know exactly what to do at times and many companies promise but don't deliver." Still another person says the documentation of products is a problem: the equipment doesn't operate exactly as promised. And another derides the conflict between intended use and "specified" capabilities. (The quotation marks are the respondent's.)

One person succinctly sums up the source of problems: "deregulation/divestiture." Others have more specific complaints. "The quality of line from Minnesota to Toronto is lousy," says one. "2,400 [baud] just barely makes it." In fact, the quality of available lines is condemned repeatedly. A couple of comments best catch the flavor: "Using voice-grade public phone lines, data moves slowly and is frequently garbled. Also, the carrier is lost at times." The problem is the "downtime of telephone lines and the inability to identify and then have the vendor fix the problem 80 percent of the time. The telephone company is very frustrating and costly."

The so-called telephone company, of course, now has several incarnations. Several of them are mentioned: Wisconsin Bell, NYNEX, Bell of Pennsylvania, Southern Bell. Ironically, each of these is named by respondents as being unable to work amicably with AT&T, their former parent. Lest any other suppliers of communications products and services feel smug about the predicament of the phone companies, they should note that all vendors are castigated for the inability to work with others. Probably the comment that raises an eyebrow the most is the one citing problems with "connecting an IBM mainframe to a Rolm CBX II." (For the uninitiated, IBM bought Rolm a couple of years ago.)

Most consistently, however, the complaints relate to the inability of users to plan and implement datacomm systems. Their problems stem from incompatible products, too many products and "less-than-expert vendor support." One respondent says there is a lack of adequate long-range plans for phase-ins and upgrades.

It should be borne in mind that these complaints come from only half of the survey's respondents. Judging from the number of different functions named as having some sort of responsibility for datacomm, however, you may conclude that the situation is just as incoherent internally as it seems to be externally. Several respondents say their problem is a lack of qualified personnel. One says, "Data communications personnel have little understanding of data processing requirements, such as transparency across multiple hardware channels or nodes."

Trying to pull coherence out of this would vex the most patient and competent among us. Only one thing appears certain: Users want—and are demanding—communications capabilities that rival the old phone system. Whether true or not, the perception was that when you got on the line, you didn't worry about being able to finish the call. It appears that datacomm users may have been divested of such confidence. (15)

Extent of Voice/Data Communications Integration

No activity	69%
Moderate activity	26%
Extensive activity	3%
Have already completed	1%
No answer	1%

Role in the Specification or Purchase of Data Communications Equipment and Services

Advise and consult	69%
Determine the need	74%
Recommend type of equipment or supplier	64%
Specify type of equipment or supplier	54%
Approve the purchase	40%
Not involved	4%
Base	889

Who Has Responsibility for Data Communications

Data processing manager	44%
Director of information systems	31%
Data communications manager	10%
Other	18%
Base	887

Person to Whom Data Communications Manager Reports

Director of information systems	46%
Data processing manager	23%
Other	31%
Base	80

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April 1987

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Circulation
Group Circulation Manager: Elen Cowles
Circulation Supervisor: Carol Tratar
Asst. Circulation Supervisor: Karen Johnson

Editorial Offices
Headquarters: Hitchcock Building
Wheaton, IL 60188, (312) 665-1000
PO Box 337
Brookline, MA 02146, (617) 723-8970
1600 Woolsey St.
Berkeley, CA 94703, (415) 528-1320
Jan Snyders
PO Box 187
Lockport, IL 60441, (815) 485-8962

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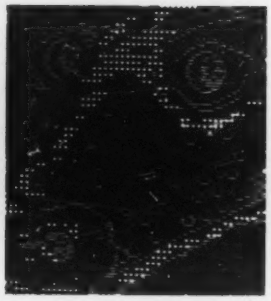

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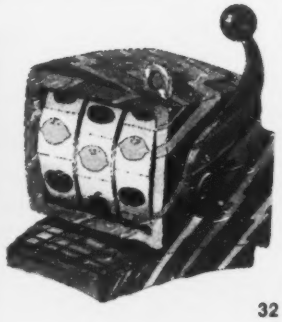

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Information Storage & Retrieval Survey

MODERATION IN ALL THINGS

With optical disks still a curiosity, current tape, disk and micrographic systems are being sustained or only minimally expanded.

■ *By Mary S. Esparza*
Assistant Editor

Maintaining current storage systems rather than expanding them is a growing trend in companies. At the same time, an inkling of interest in optical disk storage is becoming evident. These are among the findings of INFOSYSTEMS' Information Storage & Retrieval Survey.

"We are more interested in optical [disk storage] than in the past," comments one respondent. "Cartridge systems are too expensive and conversion too much of a problem for a shop that is now substantially on-line."

Yet another respondent writes: "Optical disk sounds good, but cost, flexibility and interface to nonIBM systems are all concerns." Advises another respondent, "Continue following developments in optical storage. We'll be getting serious about it in 1988 or so."

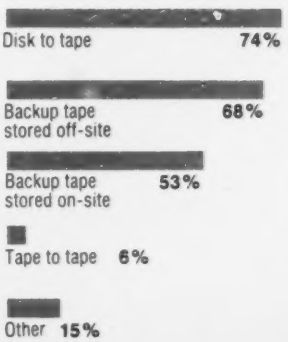
Use of optical disk appears to be hampered by high cost and a lack of knowledge about the technology. But respondents are curious nonetheless. One reader requests information on optical disk storage for a small user while another wants to know the latest developments in the write-once-read-mostly technology. One reader seems wary of optical disk technology because "the system is not perfected or standardized."

"What are the boundaries for the practical usage of CDROM [compact disk read only memory] or laser-disk technology?" asks another. "Based on the read-only capability, I believe it is being pushed far harder and farther than is justified."

Another respondent has a tall order: a low-cost storage system that would provide convenient information storage and access. "Why can't anyone develop a midsize, inexpensive system to take magnetic media and transfer it to optical storage like COM [computer-output microfilm transfers] magnetic media to fiche? Preferably this system would be channel attached (IBM CPU) like on-line COM and allow on-line (via CICS) retrieval of reports as if they came from a power queue or other CICS inquiry. Oh, the convenience and power of retrieval then!"

The survey was conducted by Hitchcock Marketing & Research Services, Wheaton, IL. Of the 3,000 surveys mailed, 607 responses were re-

Information Backup Systems Used



Plans for Information Storage & Retrieval

	DASDs	Tape	Microfilm/ fiche
Expand	47%	15%	26%
Expand & replace	13%	7%	3%
Replace current system	4%	11%	3%
Maintain current system	36%	68%	69%

ceived, a 20 percent return. The survey was sent to a random sampling of individuals pulled from INFOSYSTEMS' circulation. As an expansion of INFOSYSTEMS' annual micrographics survey conducted for the past 17 years, the intention of this study was to gather information on a range of data- and document-storage methods. Past surveys were directed only at individuals who use micrographics systems. (For information on micrographics, see the sidebar to this story.)

"Optical disk is used by less than one percent right now, but it is a promising technology," says Ray Winkler, manager of market research at Hitchcock Marketing & Research Services. "Many made comments that they will be looking into this technology in the next few years."

Although few companies are replacing their current storage systems, expansion of operations in the next year will be moderate, reveals the study: 47 percent will expand direct access storage device (DASD) systems; 15 percent plan to expand tape systems; and 26 percent will expand microfilm/fiche systems. Of the respondents surveyed, 36 percent say they plan to maintain their current DASD system, 68 percent plan to continue using their current tape system and 69 percent intend to sustain their micrographics system.

Similarly, the projections for storage and retrieval means for the next year will largely remain the same, according to the study. The majority of reel-to-reel drive users (75 percent) plan to keep the same amount of equipment, 15 percent intend to increase this means of storage and 10 percent project to decrease the use of this medium. The most significant change expected is in the DASD drives arena, with 58 percent planning to increase the number they will be using.

Small firms (100 to 249 employees) are as likely to increase their number of DASD drives as they are to sustain the ones they have. Eighty percent of the large firms (1,000 or more employees), however, plan to increase their number of DASDs. In a breakdown by industry, utilities/communications companies and wholesale/retail businesses are the most active, with more than 70 percent of the firms in these categories planning to increase DASD use.

Overall, the study reveals magnetic disk as the most widely used storage medium (97 percent). Ninety percent of the respondents use magnetic tape and 62 percent claim to use microfilm/fiche. Only .3 percent of the respondents—two of the 607—are using optical disk.

Approximate Expenditures on Information Storage & Retrieval
(in thousands of dollars)

	1986	1987
Micrographics		
% spending >$1	46%	47%
Average dollars	40	46
Optical disk		
% spending >$1	.01%	.03%
Average dollars	95	43
Magnetic media		
% spending >$1	84%	85%
Average dollars	126	145
Total average dollars for the year	133	153

Banks continue to be the biggest users, with 61 percent of those responding claiming to use some form of information storage and retrieval system. Other users above the 50 percent participation mark are finance (59 percent), utility and communications (58 percent), and transportation (51 percent).

The type of computer tape system used by 96 percent of the respondents is reel-to-reel. Fifteen percent of those users plan to increase their use of this storage method, while 75 percent intend for it to remain the same.

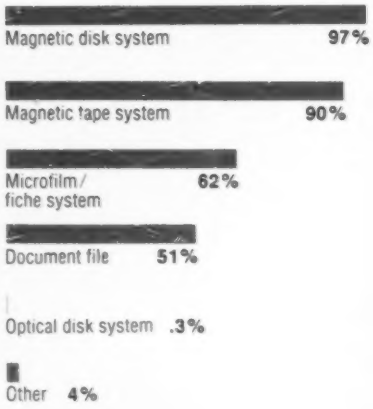
Only 25 percent of those surveyed report that they currently use the relatively new cartridge tape systems. Forty-two percent of all respondents, however, plan to increase this means of storage in the next year.

The size of a company seems to have some effect on the migration to cartridge tape systems. Both small and large companies favor reel-to-reel systems by a wide margin, but five percent of small firms use cartridge tape compared to only .9 percent of companies with 1,000 or more employees. Little more than half of all respondents who use cartridge tape plan on keeping their systems intact. Forty-two percent, however, plan to increase cartridge use.

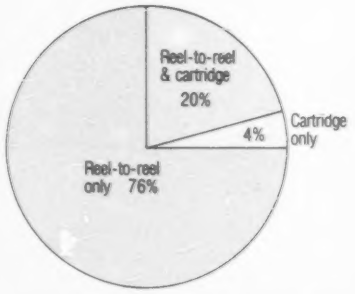
As may be expected, this increase will be at the expense of reel-to-reel systems, as only 15 percent of the users plan to increase this method of storage.

One question asked specifically about storage systems used for data backup. Disk-to-tape is the most widely used backup method, with 74 percent reporting its use. Five percent use a tape-to-tape system, while 15 percent use other methods, such as diskettes. Comments one reader: "Diskette backups are not fast, but they are very reliable. Some of our diskettes have been in use for 12 years and are still reliable."

Method Used for Storing Information



Type of Tape System Used



Several respondents are interested in learning more about storage and retrieval. One says his company is moving away from film and looking forward to image technology in the next few years. "Every little bit [of information] helps," writes another respondent. "Our interest is primarily in disk and tape storage."

One respondent seems angry at having been asked about micrographics: "Microfiche/microfilm is not a data processing concern as far as I am concerned." Perhaps this is indicative of the use of service bureaus and specialized departments to handle document storage. Counters another, however, "I believe that this area is extremely important. In fact, it reduces risk and the massive storage areas [needed] for computer runs." (15)

For more information on INFOSYSTEMS storage and retrieval survey, enter No. 12 on the Reader Information Card.

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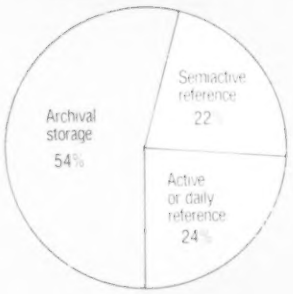

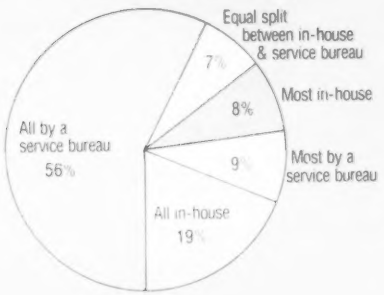
How Micrographics Needs Are Handled
All by a service bureau 56%
Equal split between in-house & service bureau 7%
Most in-house 8%
Most by a service bureau 9%
All in-house 19%

Continuing to Climb

The use of micrographics is up significantly since 1982 according to INFOSYSTEMS' Information Storage & Retrieval survey. While a minute percentage of companies are replacing current micrographics systems, the majority are choosing to maintain or expand present systems.

The survey also finds that spending on micrographics in 1987 is expected to escalate 15 percent over last year. The average expenditure on micrographics by firms in 1986 was $40,400. The projected expense per firm in 1987 is $46,300.

The main function of microfilm/fiche systems, representing more than half of all usage, continues to be archival storage. Twenty-four percent of the images stored are referenced on a daily basis and 22 percent are referred to semiactively, according to the survey.

The trend over the past five years has been toward greater use of microfilm/fiche. Projections for 1987 show increases to continue.

- Use of magnetic-media-to-film conversion will increase to 73 percent from 61 percent in 1982.
- Paper-to-film conversion will jump from six percent in 1982 to 46 percent in 1987.
- Storage of documents on microfilm/fiche has almost doubled from seven to 13 percent.

Other findings from the survey, however, project a marked decrease in the use of computer-output microfilm (COM). In-house usage was reported at seven percent for 1987. Twenty-two percent of the respondents turn to an outside service bureau for COM use. Eleven percent plan to use it within two years.

It is unlikely that new COM users will pick up the slack. The number of firms that do not have COM equipment and have no plans to implement it is projected to be 58 percent in 1987.

The handling of micrographics needs in the past five years has fluctuated between in-house systems and service organizations. "Microfilm/fiche remains to be used mainly through an outside bureau," says Ray Winkler, manager of market research at Hitchcock Marketing & Research Services, Wheaton, IL. "Only 19 percent handle all of their micrographics needs in-house."

Written comments from the survey show that attitudes toward and use of micrographics vary considerably. One respondent says his company plans to increase its use of micrographics. Another respondent writes that his company may try micrographics, while yet another says he is not familiar with the technology.

Comments one respondent: "The survey seems to be pointed at microfiche. I believe microfiche technology would be more widely used if aimed more at users (accounting, marketing, engineering) rather than to expect information systems to promote it." (IS)

Types of Micrographics Used
(by percent of respondents)

	1982 %	1983 %	1984 %	1985 %	1986 %	1987 %
Magnetic-media-to-film conversion (COM)	61	69	71	76	80	73
Paper-to-film conversion	6	7	4	4	36	46
Storage	7	7	7	9	37	13

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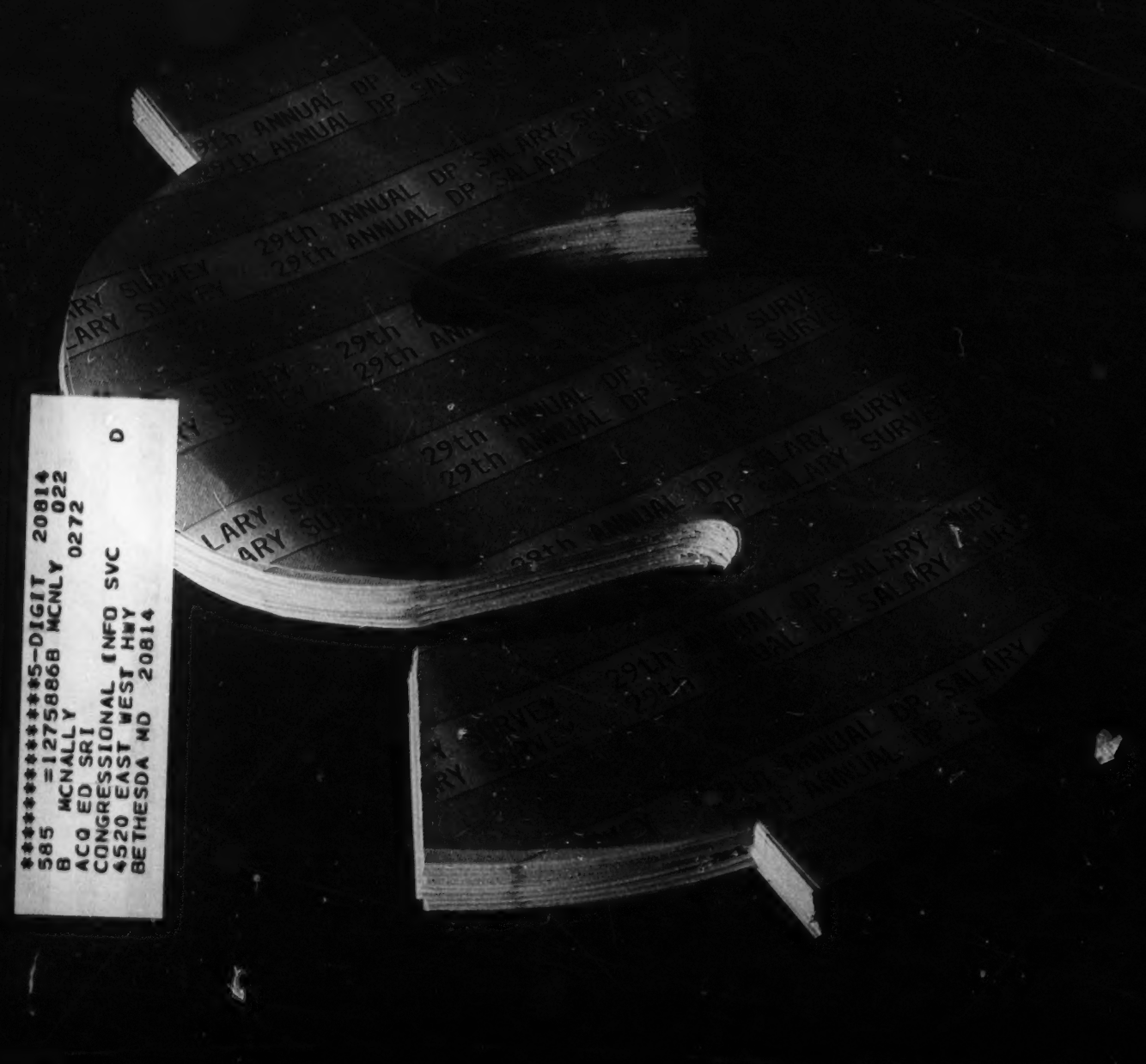
Evolving Role of the Mainframe • Disaster Recovery
Manufacturing Software • Building a Data Center

The More Things Change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Circulation
Group Circulation Manager: Ellen Cowles
Circulation Supervisor: Carol Tratar
Asst. Circulation Supervisor: Karen Johnson

Editorial Offices
Headquarters: Hitchcock Building
Wheaton, IL 60188, (312) 665-1000
PO Box 337
Brookline, MA 02146, (617) 723-8970
1600 Woolsey St.
Berkeley, CA 94703, (415) 528-1320
Jan Snyders
PO Box 187
Lockport, IL 60441, (815) 485-8982

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Management

CEO's knowledge of computers influenced by IS position

A chief executive's knowledge about computers is strongly influenced by the organizational position of the firm's information systems (IS) head. That's the conclusion of a recent study conducted by the Chicago accounting firm of Altschuler, Melvoin & Glasser.

Presidents and chief executive officers (CEOs) from the 200 largest public and private corporations in Illinois were interviewed on such issues as computer literacy, satisfaction, and dependency on computers.

In firms where the head of IS is part of senior management, CEOs tend to be more knowledgeable about corporate computer systems, more aware of the firm's dependence on computers, and more likely to develop contingency plans to safeguard against possible shutdowns. They are also more likely to buy the same computer systems again.

On the other hand, when IS heads are middle managers, CEOs are less satisfied with their knowledge of the firm's computer systems, and less aware of how the firm depends on computers. They also feel unqualified to evaluate whether they'd invest in their current computer systems again.

All firms surveyed are active computer users. The IS head is a member of senior management in 40 percent of the firms surveyed, and a middle manager in 60 percent.

CEO Satisfaction

	Percent of respondents:	
	With IS part of senior management	With IS part of middle management
Satisfaction with knowledge of computer systems operation:		
Very satisfied	17	10
Satisfied	72	55
Dissatisfied	11	35
Satisfaction with knowledge of information generated by systems:		
Very satisfied	28	10
Satisfied	67	71
Dissatisfied	11	19

In 58 percent of the firms that have IS in a senior management position, the manager reports to the president or CEO. In 26 percent of those firms, the manager reports to an executive vice president.

Of the IS heads who are middle managers, almost half report to a controller, chief financial officer or vice president of finance. About one-fourth report to the president or CEO.

The greater computer knowledge of CEOs who have IS managers in senior positions is perhaps due to greater interaction between the two. This was not conclusively determined by the study, however.

The complete report is available for $10. For more information, enter No. 7 on the Reader Information Card.

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29th Annual DP Salary Survey

The More Things Change

Salaries changed slightly this year in the face of what may be monumental changes for the way DP delivers its services.

■ *By Wayne L. Rhodes Jr. Editor*

Respondents to INFOSYSTEMS' 29th Annual Data Processing (DP) Salary Survey report a pay increase of just under three percent this year. That nearly triples the increase reported a year ago, but is still well below historic patterns. This year's raise (2.8 percent) seems in line with more traditional measures, such as the cost-of-living index, for determining salaries.

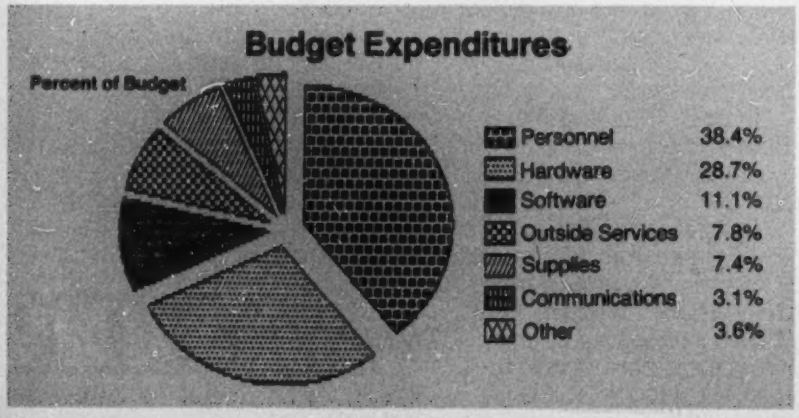
Increases range from two percent for a data entry supervisor, up to 19.6 percent for a project/team leader. Only one other position reports a double-digit increase in salary. That is data/telecommunications manager. The top information systems (IS) official's average salary went up 5.6 percent; the manager of data processing went up 7.3 percent.

Several positions actually report lower salaries in 1987 than in 1986. This usually indicates new people being paid at entry levels for those jobs. Those positions reporting lower salaries in 1987 include applications programmer, manager of data base systems, communications operator, data entry operator and office automation specialist.

Information center analyst/trainer reports a 3.2 percent increase. Other related positions, such as manager of microcomputers and information center manager, for example, came in lower this year. That probably means entry-level people are being assigned those positions due to the relative newness of the jobs. It also may indicate some uncertainty as to what salaries those jobs should command.

Over 7,000 jobs reported on. Hitchcock Research Services of Wheaton, IL, conducted the survey. Ray Winkler, director of Hitchcock Research Services, prepared the questionnaire and analyzed results. The survey contains information on 7,692 jobs. The information comes from 595 firms selected at random from INFOSYSTEMS' circulation across the nation. Salaries are based on those in effect as of March 1. They include full-time personnel only. Figures do not include bonuses and other benefits.

The top IS official's average weekly salary is $1,131. The highest reported salary for that position is $175,000. Six people report salaries exceeding $100,000. Three others say their salary ranges could take them above $100,000. One of those reporting a salary of $120,000 is the president of a DP-oriented business. The others all have titles such as senior vice president (2), executive vice president, director of MIS (2), vice president of DP



and general manager of information technology.

The second highest salary goes to the data/telecommunications manager ($879 per week). That position also reports one of the highest increases in salary from last year. This is, of course, indicative of the attention that communications and networking are getting throughout the computer industry. People who can manage this area are in demand both on the user and vendor fronts.

The lowest reporting group of salaries is in computer operations. Salary increases are low here also. The only exception is the tape librarian. The salary for this position went up 8.4 percent. Overall, however, the survey underscores that data center operations have matured in relation to other computer-based activities. Companies are looking for cost efficiencies there while they turn their attention to other forms of computing such as departmental.

The financial industry reports the highest average salary for the top IS official and the lowest salary for applications programmers. The public utilities sector consistently ranks among the best payers in virtually every job.

Largest budget item. Salaries still make up the largest share of the DP budget at 38.4 percent. That share has been steadily declining, however, during the past four years. Personnel costs as a share of budget are at the lowest they have been in nine years. The next largest budget item is hardware and its maintenance at 28.7 percent. Software expenditures have been steadily increasing during the past four years, going from 9.5 to 11.1 percent of the budget. No other item exceeds eight percent.

Data processing employees make up approximately three percent of their organization's total employment. The average number of people in the reporting companies is 736. The average number of DP employees is 24. Hitchcock breaks employment down by equipment rental range. For example, a company whose equipment rental is under $3,000 per month has 241 employees overall, with three in DP. By comparison, a company with a $100,000 to $149,000 range has 39 DP employees out of 1,776 overall. That's 1.3 percent and 2.1 percent, respectively.

Over half of the companies reported turnover in their organizations. That has been pretty consistent during the past four years. The percentage of new employees, however, climbed notably from last year. This year, respondents reported 23.3 percent of their employees are new; last year they reported 13.5 percent.

Last year's survey reported virtually no change in overall salaries after several years of impressive growth. That may have prompted employees to look elsewhere for salary increases. The more than 20 percent turnover is reminiscent of the job changing associated with data processing in the 1970s.

Over a quarter of the respondents said they have unfilled positions. These average 3.1 per company. During the four years this question has been asked, the number of respondents has been relatively constant (23.2 to 26.2 percent). The number of unfilled positions has alternated between just over two and just over three.

In a new survey question, Hitchcock tried to determine how people are assigned to different functions. It finds an average of 6.4 people assigned to computer operations and 5.5 people involved in systems analysis/programming, for example.

Opportunity to comment. Hitchcock gave respondents an opportunity to comment on the survey. Their comments give valuable insight into the state of DP.

"Good minicomputers are nearly 'operatorless' systems," writes a respondent. "An organizational structure can vary from one location to another. We have three large-scale platterns and our two computer operators are really plattern operators. They not only run the system, reboot, take backup and maintain the tape library, but they produce ink on media plots 36x48 inches. They are more skilled than data entry personnel, but do enter data. We have not found an adequate title for them either."

"We are changing to decentralized data processing with computer hardware now located in various departments and division offices," says a writer. "Our data processing department personnel are switching toward becoming 'value added resellers' or a 'systems house' selling both hardware and software within our company (to divisions) and outside of the company (to customers). We now do very little computer operations, but [train others] to do it part-time."

"Data entry is almost a thing of the past," asserts a respondent.

All entry work has been spread to the user departments, reports another. "We have seven printers not in DP," this person writes. "All A/P, A/R, census data, inventory and a special word processing application are done at other offices on-line (hard wired) to the computer. All but one programmer are part-time employees moonlighting. The manager of systems/programming and I spend 50 percent plus [of our time] programming."

A respondent says the survey form is difficult to answer when systems/programming staff and information

Number of Employees in DP vs. Company

(By equipment rental range)

Rental Range Per Month	Average Number in DP	Average Number in Company
Under $3,000	3.2	241.2
$3,000 to $4,499	4.9	289.8
$4,500 to $5,999	5.4	325.0
$6,000 to $8,999	6.4	339.7
$9,000 to $11,999	6.6	340.0
$12,000 to $14,999	7.9	356.8
$15,000 to $17,999	11.4	551.7
$18,000 to $24,999	19.4	768.4
$25,000 to $49,999	20.1	810.0
$50,000 to $74,999	20.7	1092.6
$75,000 to $99,999	36.8	1351.7
$100,000 to $149,999	36.8	1776.3
$150,000 and over	176.6	3004.0
Not Available	39.9	1039.4
All Companies	**24.9**	**736.4**

Functional Responsibility

Functional Area	Percent Having People Assigned	Average Number of People Assigned
DP/MIS Management	92.4%	2.8
Systems Analysis and/or Programming	67.8%	5.5
Applications Programming	48.2%	12.4
Computer Operations	84.2%	6.4
Information Center	19.5%	3.7
Data-Telecomm.	20.4%	5.1
Training	16.3%	2.8
Data Entry	45.7%	4.9
Other	19.9%	9.0
TOTAL	**160.0%**	**24**

29th Annual DP Salary Survey
Average Reported Weekly Salaries by Geographic Area

Job Description	Job Code	New England ME, VT, NH, MA, CT, RI	Mid Atlantic NY, PA, NJ	So. Atlantic WV, MD, DE, VA, NC, SC, GA, FL, DC	East North Central MI, WI, IL, IN, OH	East South Central KY, TN, MS, AL	West North Central ND, MN, SD, NE, IA	West South Central TX, OK, AR, LA	Mountain UT, MT, CO, NV, WY, CO, AZ, NM	Pacific WA, OR, CA	1985	1986	National Average Comparison Increase Decrease
MANAGEMENT		(28)	(90)	(57)	(157)	(13)	(46)	(49)	(18)	(97)	(633)	(558)	—(No. Firms)
Top MIS Official	(01)	1361	1327	1038	1088	1002	994	973	**	1147	1071	1131	+5.6
Manager of Data Processing	(02)	838	875	832	824	706	715	829	713	836	764	820	+7.3
Assistant Manager of Data Processing	(03)	653	752	793	858	**	488	866	**	829	734	799	+8.9
Manager of Data Base Systems	(04)	1071	770	881	831	**	483	**	**	963	742	725	−2.3
SYSTEMS ANALYSIS													
Manager/Supervisor of Systems Analysis	(05)	874	853	865	903	**	628	879	**	828	750	820	+9.3
Systems Analyst	(06)	700	665	747	663	572	592	717	691	706	631	687	+8.9
APPLICATIONS PROGRAMMING													
Manager/Supervisor of Applications Programming	(07)	825	759	900	765	669	607	844	771	814	741	796	+7.4
Applications Programmer	(08)	538	575	600	385	479	485	617	589	653	538	478	−11.2
DATA/TELECOMMUNICATIONS													
Data/Telecommunications Manager	(09)	**	878	870	957	**	**	820	**	812	774	879	+13.6
Communications Analyst	(10)	**	675	572	746	**	451	666	**	614	658	682	+3.6
Communications Operator	(11)	375	**	438	264	**	257	591	**	457	426	323	−24.2
COMPUTER OPERATIONS													
Data Center Manager	(12)	728	699	659	650	570	576	692	602	693	670	663	−1.0
Computer Operator	(13)	382	365	437	380	323	344	403	370	402	367	386	+5.2
Computer Input/Output Control Manager	(14)	427	447	424	466	**	396	603	**	414	423	440	+4.0
Tape Librarian	(15)	**	326	421	481	**	**	313	**	370	346	375	+8.4
Data Entry Supervisor	(16)	448	408	439	423	387	331	454	**	455	401	409	+2.0
Data Entry Operator	(17)	335	334	332	275	264	260	293	313	343	308	301	−2.3
OTHER													
Project/Team Leader	(18)	787	825	820	839	**	711	814	648	**	678	811	+19.6
Information Center Manager	(19)	**	648	708	813	**	737	**	**	**	743	729	−1.9
Information Center Analyst/Trainer	(20)	547	538	585	604	**	493	**	**	542	534	551	+3.2
Manager of Microcomputers	(21)	468	473	**	565	**	538	**	513	**	616	575	−6.7
End User Computer Specialist/Office Automation Specialist	(22)	426	445	333	494	455	332	**	499	481	537	443	−17.5

NI = Not included **Indicates insufficient information available

center staff is distributed throughout the country. "An example is my company," the writer says. "Louisville, KY, total 72 professionals; Cincinnati, OH, 17 professionals; Port Arthur, TX, three; Houston, eight; Clinton, IA, five; Morris, IL, five; and Chicago, 19. All are on the headquarters IS budget and report directly to headquarters IS."

Another respondent has created a position: Systems Coordinator. This individual maintains all vendor systems software releases on three machines; designs data bases; writes special functional routines in Cobol to store and retrieve data base records; and monitors three programmers.

Comments emphasize overall that data processing is in a constant state of flux. Positions and responsibilities change, but the more they change the more the underlying reason for being stays the same: providing computer-based services. Where once it was strictly data processing, now it is information services. Some telling pieces of information about change, however, bear pointing out. Only 8.3 percent of the companies even use a title suggestive of IS management; DP is still the formal name of the game. Despite press and vendor hoopla to the contrary, most DP/IS managers do not report directly to the top. That only happens in 43 percent of the cases. And that, by the way, is down 10 percent since 1979. (15)

Salary Breakouts

A comprehensive breakout of salary information can be found in chart form on the following pages. The breakout is by geographic area, by size of installation and by industry (15)

Complete DP Salary Survey

A complete copy of INFOSYSTEMS' 1987 DP Salary Survey can be ordered for $50. The report includes replies to the 17 questions in the study by industry and equipment rental range, as well as salary data for the 22 job functions. Send check or company purchase order to Hitchcock Executive Book Service, 25W550 Geneva Rd., Wheaton, IL 60188.

Job Descriptions Available

Detailed job descriptions for the 22 DP positions surveyed are available free of charge. For a copy, enter No. 20 on the Reader Information Card.

29th Annual DP Salary Survey
Average Reported Weekly Salaries by Industry

Job Description	Job Code	Advertising, Printing & Publishing	Banking	Educational	Engineering, Construction	Governmental Agencies	Hospital, Health Care	Insurance	Financial	Public Utilities	Retail Sales & Distrib.	Data Proc. Services
MANAGEMENT		(29)	(12)	(51)	(12)	(60)	(32)	(20)	(9)	(8)	(17)	(8)
Top MIS Official	(01)	1329	**	868	725	801	1020	1476	1685	1592	1073	**
Manager of Data Processing	(02)	880	823	687	684	783	673	906	1237	1244	722	711
Assistant Manager of Data Processing	(03)	612	596	602	**	771	640	726	1161	898	**	**
Manager of Data Base Systems	(04)	**	**	**	**	699	**	484	836	1087	**	**
SYSTEMS ANALYSIS												
Manager/Supervisor of Systems Analysis	(05)	874	779	783	**	772	691	680	951	965	**	776
Systems Analyst	(06)	724	514	566	**	682	563	595	745	697	597	772
APPLICATIONS PROGRAMMING												
Manager/Supervisor of Applications Programming	(07)	641	603	592	**	630	**	808	758	948	779	**
Applications Programmer	(08)	463	537	471	445	535	467	552	330	673	456	565
DATA/TELECOMMUNICATIONS												
Data/Telecommunications Manager	(09)	**	**	**	**	706	**	**	1072	927	**	**
Communications Analyst	(10)	**	**	**	**	483	**	**	759	728	**	**
Communications Operator	(11)	**	330	**	**	516	**	**	260	**	**	**
COMPUTER OPERATIONS												
Data Center Manager	(12)	612	538	619	**	640	580	682	761	892	486	**
Computer Operator	(13)	417	277	347	310	358	333	463	373	506	331	354
Computer Input/Output Control Manager	(14)	537	429	377	**	461	377	385	**	606	383	**
Tape Librarian	(15)	**	**	**	**	315	**	384	**	376	**	**
Data Entry Supervisor	(16)	348	**	374	**	460	382	329	**	516	343	**
Data Entry Operator	(17)	303	211	299	266	341	292	325	227	392	270	311
OTHER												
Project/Team Leader	(18)	790	**	**	**	679	667	693	**	800	**	**
Information Center Manager	(19)	453	**	561	**	634	**	**	**	767	**	**
Information Center Analyst/Trainer	(20)	**	**	**	**	439	**	516	576	728	**	**
Manager of Microcomputers	(21)	**	**	345	**	469	**	**	**	543	**	**
End User Computer Specialist/Office Automation Specialist	(22)	**	375	344	**	439	448	400	518	**	**	**

Job Description	Job Code	Other Services (non-DP)	Transportation	Wholesale Sales & Distrib.	Manufacturing and Processing: Electrical, Electronic	Food, Tobacco, Drugs	Machinery, Instruments, Equip.	Metal Producing & Fab.	Apparel, Textiles	Lumber, Wood, Furn., Paper	Chemicals, Petro., Coal	Rubber, Leather, Glass, Clay	Other
MANAGEMENT		(28)	(10)	(30)	(27)	(22)	(47)	(39)	(11)	(12)	(15)	(17)	(19)
Top MIS Official	(01)	1135	1206	1208	1063	1198	1207	981	1087	1019	1471	**	921
Manager of Data Processing	(02)	711	710	768	936	759	841	768	931	864	832	678	736
Assistant Manager of Data Processing	(03)	629	**	**	**	**	**	**	**	**	**	**	**
Manager of Data Base Systems	(04)	**	**	**	929	**	**	**	**	**	**	**	**
SYSTEMS ANALYSIS													
Manager/Supervisor of Systems Analysis	(05)	816	**	853	782	966	770	**	**	**	927	788	**
Systems Analyst	(06)	623	728	736	731	710	672	623	758	739	770	650	674
APPLICATIONS PROGRAMMING													
Manager/Supervisor of Applications Programming	(07)	**	910	688	821	637	844	**	**	**	**	**	737
Applications Programmer	(08)	566	690	531	571	539	598	547	568	570	648	516	567
DATA/TELECOMMUNICATIONS													
Data/Telecommunications Manager	(09)	**	873	615	**	**	**	**	**	**	**	**	**
Communications Analyst	(10)	**	605	**	**	652	**	**	**	**	674	**	**
Communications Operator	(11)	524	417	**	**	**	**	**	**	**	621	**	**
COMPUTER OPERATIONS													
Data Center Manager	(12)	**	**	744	803	686	621	539	687	**	859	470	**
Computer Operator	(13)	374	399	330	370	384	402	346	448	393	439	296	371
Computer Input/Output Control Manager	(14)	**	431	**	**	455	470	**	**	**	530	**	**
Tape Librarian	(15)	**	462	**	**	**	**	**	**	**	**	**	455
Data Entry Supervisor	(16)	438	**	391	302	439	347	403	**	**	**	**	334
Data Entry Operator	(17)	294	363	270	**	309	313	335	**	252	332	271	**
OTHER													
Project/Team Leader	(18)	**	875	**	**	**	**	**	**	**	**	**	**
Information Center Manager	(19)	**	892	**	**	**	**	**	**	**	**	**	**
Information Center Analyst/Trainer	(20)	512	619	**	548	**	**	**	**	**	795	**	**
Manager of Microcomputers	(21)	569	**	512	**	**	**	**	**	**	**	**	**
End User Computer Specialist/Office Automation Specialist	(22)	530	**	**	**	**	503	**	**	**	**	**	**

—(No. Firms)

**Indicates insufficient information available

29th Annual DP Salary Survey

Weekly Salaries for All Jobs: Nationwide and by Size of Installation

Job Description	Job Code	Number Reported	Lowest Reported Actual Salary	25th Percentile Actual Salary	National Average Actual Salary	Median Actual Salary	Mode Actual Salary	75th Percentile Actual Salary	Highest Reported Actual Salary	Established Salary Range—Average Low	Established Salary Range—Average High
		NATIONAL STATISTICS									
MANAGEMENT											
Top MIS Official	(01)	163	384	865	1131	1078	1153	1269	2403	910	1194
Manager of Data Processing	(02)	435	317	635	820	800	961	961	1842	675	958
Assistant Manager of Data Processing	(03)	105	267	617	799	865	888	900	1500	604	870
Manager of Data Base Systems	(04)	86	317	450	725	711	384	1038	1448	739	1056
SYSTEMS ANALYSIS											
Manager/Supervisor of Systems Analysis	(05)	233	408	673	820	826	576	961	1500	670	962
Systems Analyst	(06)	706	279	576	687	686	692	769	1292	536	803
APPLICATIONS PROGRAMMING											
Manager/Supervisor of Applications Programming	(07)	207	278	615	796	800	888	888	1826	658	930
Applications Programmer	(08)	2610	230	346	478	423	346	611	1250	408	677
DATA/TELECOMMUNICATIONS											
Data/Telecommunications Manager	(09)	50	442	746	879	902	923	995	1192	650	942
Communications Analyst	(10)	126	346	576	682	692	692	788	1015	478	763
Communications Operator	(11)	104	200	269	323	307	269	384	673	317	497
COMPUTER OPERATIONS											
Data Center Manager	(12)	179	240	525	663	634	576	798	1293	558	811
Computer Operator	(13)	1226	161	326	386	384	346	465	946	299	455
Computer Input/Output Control Manager	(14)	111	250	360	440	426	423	461	823	343	517
Tape Librarian	(15)	60	223	269	375	346	269	410	807	295	432
Data Entry Supervisor	(16)	108	200	326	409	384	307	480	846	344	496
Data Entry Operator	(17)	786	105	238	301	291	173	355	596	247	363
OTHER											
Project/Team Leader	(18)	111	484	709	811	817	817	894	1184	644	946
Information Center Manager	(19)	46	326	576	729	735	769	863	1332	651	955
Information Center Analyst/Trainer	(20)	123	274	426	551	507	500	642	1011	436	694
Manager of Microcomputers	(21)	33	140	493	575	552	576	631	923	521	755
End User Computer Specialist/Office Automation Specialist	(22)	84	197	352	443	428	384	519	884	371	584

Job Description	Job Code	Under $1,000 Mo.	$1,000-$2,499 Mo.	$2,500-$4,999 Mo.	$5,000-$7,999 Mo.	$8,000-$11,999 Mo.	$12,000-$14,999 Mo.	$15,000-$17,999 Mo.	$18,000-$24,999 Mo.	$25,000-$49,999 Mo.	$50,000-$74,999 Mo.	$75,000-$99,999 Mo.	$100,000-$149,999 Mo.	$150,000 and over
		AVERAGE SALARY—BY EQUIPMENT RENTAL RANGE												
MANAGEMENT		(72)	(41)	(49)	(51)	(59)	(39)	(29)	(39)	(76)	(28)	(10)	(12)	(33)
Top MIS Official	(01)	677	1125	924	1011	1032	1209	867	1179	1265	1097	977	1445	1470
Manager of Data Processing	(02)	619	720	751	752	792	855	727	826	891	977	882	1061	1184
Assistant Manager of Data Processing	(03)	**	651	**	**	665	741	**	522	654	871	**	986	932
Manager of Data Base Systems	(04)	**	**	**	**	**	**	**	498	808	**	702	909	999
SYSTEMS ANALYSIS														
Manager/Supervisor of Systems Analysis	(05)	**	600	**	873	708	840	720	651	826	832	**	820	975
Systems Analyst	(06)	535	535	607	610	622	667	613	712	683	671	593	704	737
APPLICATIONS PROGRAMMING														
Manager/Supervisor of Applications Programming	(07)	**	**	**	576	651	774	652	776	835	614	524	**	936
Applications Programmer	(08)	446	463	567	547	485	537	481	591	550	524	441	536	446
DATA/TELECOMMUNICATIONS														
Data/Telecommunications Manager	(09)	**	**	**	**	**	**	**	836	718	779	689	**	961
Communications Analyst	(10)	**	**	**	608	**	627	**	624	541	700	696	**	727
Communications Operator	(11)	**	**	**	**	**	**	**	**	447	386	**	**	308
COMPUTER OPERATIONS														
Data Center Manager	(12)	377	**	486	604	511	581	653	725	624	676	707	854	854
Computer Operator	(13)	343	351	344	351	361	355	331	356	388	377	332	432	459
Computer Input/Output Control Manager	(14)	315	484	**	375	**	**	424	333	461	**	386	529	483
Tape Librarian	(15)	**	**	**	**	**	**	**	**	353	454	294	421	408
Data Entry Supervisor	(16)	410	349	436	**	453	395	359	339	384	405	**	390	637
Data Entry Operator	(17)	294	279	322	286	332	329	281	281	261	309	283	354	316
OTHER														
Project/Team Leader	(18)	**	**	**	**	**	**	**	**	730	728	782	798	846
Information Center Manager	(19)	**	**	**	**	**	**	**	**	728	**	734	**	748
Information Center Analyst/Trainer	(20)	**	**	**	**	**	443	470	**	538	520	473	594	631
Manager of Microcomputers	(21)	**	**	**	**	360	**	**	569	579	**	**	613	635
End User Computer Specialist/Office Automation Specialist	(22)	**	**	**	416	**	**	400	**	415	415	418	**	523

*Median—A figure having an equal number above and below
*Mode—The salary reported most often
*25th Percentile—That point at which 25% of all other salaries are lower and 75% are higher
*75th Percentile—That point at which 75% of all other salaries are lower and 25% are higher
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Building the IS Architecture Electronic Mail Software

IBM and OS/2 Take On the Clones

The Evolution of Automated Office Systems

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Circulation
Group Circulation Manager: Ellen Cowles
Circulation Supervisor: Carol Trafar
Asst. Circulation Supervisor: Karen Johnson

Editorial Offices
Headquarters: Hitchcock Building
Wheaton, IL 60188 (312) 665-1000
PO Box 337
Brookline, MA 02146 (617) 723-8970
1600 Woolsey St.
Berkeley, CA 94703 (415) 528-1320
Jan Snyders
PO Box 187
Lockport, IL 60441 (815) 485-8962

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Phone: (312) 665-1000 Cable: HITCHPUB
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FAX (312) 462-2225

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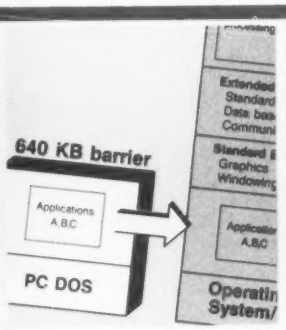

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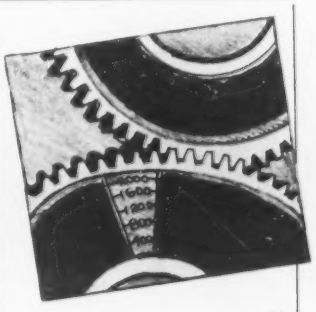

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Communications

People look to private, dedicated network when they have a problem

Public and private value-added packet-switching networks are increasing in popularity. Private data networks, specifically, are experiencing marked growth as compared to individual public carriers, according to research by Computer Intelligence Corp. (CIC), La Jolla, CA.

These value-added networks are generally based on packet-switching technology and include enhancements to the fundamental movement of data, CIC learned. Enhancements often involve code, speed and protocol conversion as well as packet assembly and disassembly. The services of public data networks are offered to companies through value-added network carriers; private data networks are built and operated for the sole use of particular business entities.

People look to dedicated, proprietary communications networks when they have a problem, according to the vice president of marketing for the world's largest supplier of private packet-switching networks. Jeff Palmer of BBN Communications Corp., Cambridge, MA, says there are five reasons why people buy networks: reliability, economy, control, flexibility and performance.

BBN has installed more than 30 private networks for such customers as MasterCard, the US Custom Service, Procter & Gamble and Barclay's. The firm's work on the Dept. of Defense's ARPANET led to the founding of Telenet, a public packet-switching network supplier subsequently sold to GTE. Both Salomon Brothers and market researcher International Data Corp. have declared BBN Communications the leading supplier of private packet-switching networks.

Palmer elaborates on the reasons why people buy networks. "The reliability includes such capabilities as automatic rerouting of data if a network node goes down," he explains. "The economies are that you can develop your own communications utility that is vendor independent. Network management is the essence of control. You have your own window into a distributed, unmanned network. You can isolate problems and get [them] repaired."

The flexibility of a private network is alluring, according to Palmer. He said the topology can be relatively arbitrary. BBN offers basically a mesh topology, but it can be modified to encompass a star. He pointed out that as the network expands, it recognizes changes and automatically reroutes communications. The user does not have to generate reroute schemes.

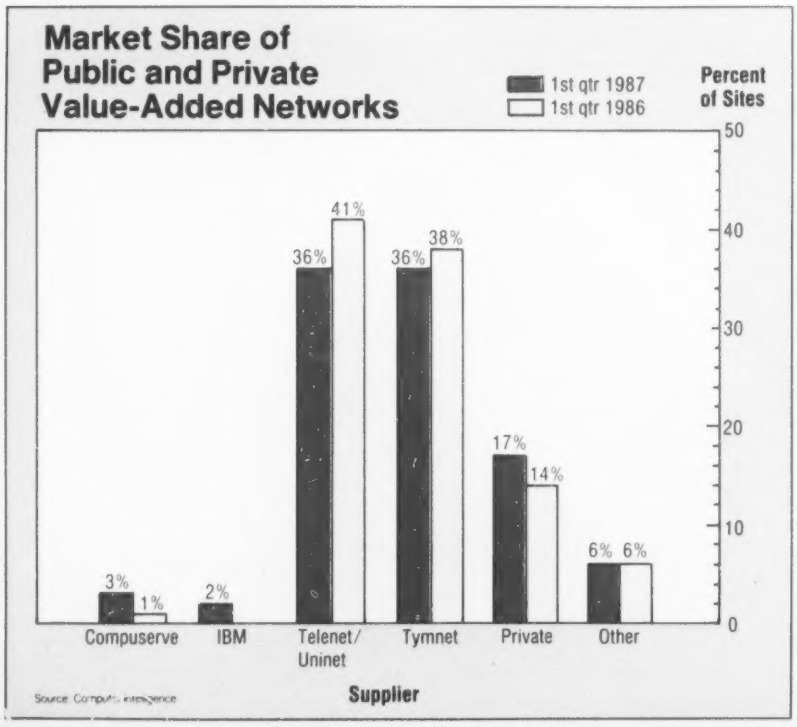
Superior performance, according to Palmer, stems from the fact that the supplier is usually focused on just one thing: end-to-end communications, in essence functioning as a front-end communications processor.

BBN's customers have elected to go with a private network for any combination of these reasons, according to Palmer. "Weyerhauser wanted to build a corporate [communications] utility," he says, "because it discovered that it was using 12 different networks. MasterCard was expanding its transaction handling worldwide and needed the flexibility to add services and applications."

The major problem facing organizations is not communications, Palmer declares. It is distributed computing. "I would argue that most data processing networks are private, not public: mainframe, modems, multidrop lines," he says.

Palmer concedes advantages do exist in some cases on the side of public networks. Public networks typically provide more cost-effective access to remote or low-traffic locations. He says they are better for low-duty cycle applications. He adds, however, that as soon as the duty cycles get heavy, private lines are the answer.

The ability of suppliers—private or public—to deploy networks has been slowed by the wait for lines, according to Palmer. "It doesn't seem to be a shortage of bandwidth in the carriers. There seems to be a shortage of personnel to write orders. We can manufacture faster than lines can be delivered," he says. —WLR



■ By R.E. (Bob) Johnston
Contributing Editor

Acquisition Insecurity

Users beware: With the acquisition of Uccel, Computer Assoc. now controls more than 50 percent of the information security software market.

For many, the acquisition of Uccel Corp. by Computer Assoc. International (CAI) spells insecurity. Five years ago few managers operating computers in the IBM MVS environment even knew of CAI. Today, most are paying more software lease/maintenance fees to CAI than any other supplier except IBM. While the merger is not final until this month, you can be assured it will happen. It was negotiated by Charles B. Wang, CAI chairman, and Swiss tycoon Walter Haefner, who holds 58 percent of Uccel. As a result, Haefner will become the largest CAI stockholder.

In a little more than 10 years, CAI has grown from a start-up company to the largest independent supplier of software. This phenomenal growth has caused many to ask whether CAI's takeover of Uccel is monopolistic. Appearances are deceiving, however. The projected annual revenue of the combined forces of CAI and Uccel ($650 to $700 million) is less than 20 percent of the more than $5 billion software income reported by IBM.

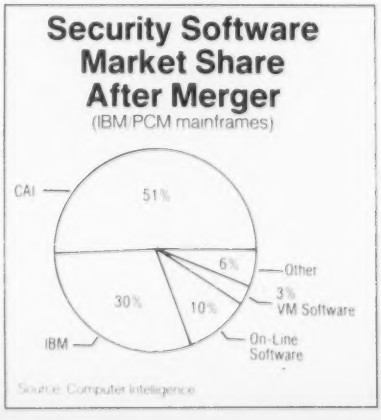
Ordinarily, information security practitioners are not concerned about corporate maneuvers. Just a little more than 18 months ago, none of us would have been concerned. Then, CAI purchased Top Secret from CGA Software. With the acquisition of Uccel, which owns ACF2, CAI now controls more than 50 percent of the information security software market. Numerous niche-market security products exist (VM, DOS/VSE and CICS), but their cumulative share is less than five percent. The Uccel acquisition leaves IBM as CAI's only true competition.

IBM is a formidable competitor in terms of gross software sales. The bulk of IBM's software revenue, however, comes from operating systems and operating-system support products (MVS, VM, DOS/VSE, RACF, CICS, IMS, DB2). The only product in this list that CAI directly competes with is RACF. CAI's other products improve on those IBM environments rather than compete with them.

CAI has become the only software supplier with a product line to service all of a customer's needs. Often the first product obtained is tape management. CAI controls two-thirds of the market having now both UCC-1 and CA/TLMS in its stable. Job scheduling is another popular tool. CAI now controls UCC-7, CA/Scheduler, ADC2 and DCMS: over 90 percent of the packages in use. With these primary areas of the MVS environment now under CAI's control, expect price increases.

Today, most are paying more software lease/ maintenance fees to CAI than any other supplier except IBM.

CAI also has strong contenders in other areas. While CAI may not currently control the lion's share in these other areas, the intriguing question is what could happen with CAI being the only vendor on the block with such a complete product line? Information security practitioner's may have cause for concern. The history of CAI as it relates to other acquisitions is worth consideration.



Some staff reductions at the larger company will occur: Redundancies will be eliminated. Conversion to CAI's support system and sales force will take place. Undoubtedly, a reduction in research and development (R&D) will occur. A good portion of R&D is devoted to making products better than the competition. Does this make sense when your biggest competitor is yourself?

A combined R&D budget in excess of $55 million leaves a good deal of room for trimming, particularly if duplication is eliminated. A lot of people argue that it would not be wise for CAI to alienate its clients by forcing them to switch. Economically, however, it appears that it would be smart. Historically, such switches forced by software firms have been successful—based on the vendor's point of view. Many clients forced to switch paint a differing picture; some even chose to switch to a third vendor.

This being the case, where do you start if you are a vendor with duplicate products? Do you act in those areas where credible competition exists or do you start where the client's choice is nil? If it chooses the path of least competition, CAI will likely trim its product offerings in the areas of security, tape management and job scheduling.

A much harder question to address is which specific products will be affected. Several factors in this decision are not known to consumers. My thoughts on this issue are biased because my company uses several CAI products. I believe, however, that CAI's decisions in this area will be based on business realities. Such issues as long-term marketability, ease of maintenance and the product's state of the art will all be important.

Many of the problems that arise as competition diminishes are detailed in my June 1987 column, "A Security Vendor's Responsibilities." In that article, I cited six major concerns: confidentiality, disclosure of flaws, escrow, customer support, maintenance and development.

I am concerned that disclosure of

flaws, customer support and maintenance will suffer as a result of the reduced competition of this merger. These areas are most frequently not given the attention they deserve. It was also these areas that were extensively discussed at the Top Secret Users Conference in 1986 and 1987.

I am concerned that a user's choice of information security products will not be as objective as in the past. The easy choice will be either IBM or CAI. Other vendors in the marketplace deserve consideration, however. They are working hard at product development and might have the best product set for a given company. Let's take a look at these firms.

- Goal Systems International, Columbus, OH, entered the security marketplace with its Alert/CICS product in 1984. It quickly grabbed a segment of this specialized security niche. Alert/VSE was subsequently introduced to address the DOS/VSE environment. Alert/VM and Alert/MVS were introduced in 1987. (Enter number 12 on the Reader Information Card for specific information on Goal Systems' security products.)
- On-Line Software International, Ft. Lee, NJ, offers the Omniguard product line. Protection is also offered for VM, DOS/VSE and MVS. Omniguard was originally a CICS-only product known as Guardian. Consequently, the lion's share of On-Line's client base is in CICS. On-Line's growth has been due in part to its ability to acquire several smaller competing companies. (Enter number 13.)
- VM Software, Reston, VA, offers VMSecure. The product has received wide acceptance because of its early entry into the VM security market. It is frequently bundled with other VM products as a complete set. (Enter number 14.)

If you are in the market for a security product in the IBM mainframe arena, the big guys must also be considered. CAI markets ACF2 and CA/Top Secret. ACF2 offers protection for MVS, VM and DOS/VSE. CA/Top Secret offers similar controls. (Enter number 15.) IBM markets RACF, which offers controls for MVS and VM. (Enter number 16.) It should be noted that the base product for MVS offered by ACF2, RACF and CA/Top Secret includes security for CICS that is not available separately. (15)

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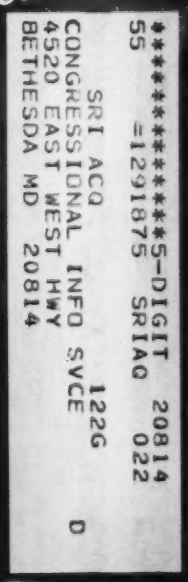
John Diebold on IS in Midsize Companies:

"The importance of information technology . . . is no less applicable for the small to midsize company than for the corporate giant."

A New Data Entry Era



HP's RISC • Ada & the Mini Makers

Third-Party Maintenance • DBMS Tools

Changing the PC Standard

ISSN 0364-5533

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Myles E. Walsh
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Circulation
Group Circulation Manager: Ellen Cowles
Circulation Supervisor: Carol Tratar
Asst. Circulation Supervisor: Karen Johnson
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Wheaton, IL 60189-9933

Editorial Offices
Headquarters: Hitchcock Building
Wheaton, IL 60188, (312) 665-1000
PO Box 337
Brookline, MA 02146, (617) 723-8970
1600 Wootsey St.
Berkeley, CA 94703, (415) 528-1320
Jan Snyders
PO Box 187
Lockport, IL 60441, (815) 485-8862

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FAX (312) 462-2225

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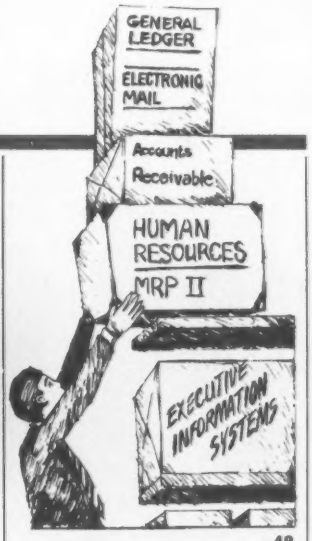

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Cover and inside photos of John Diebold by Maria Parascandolo.

Computer Maintenance: Bypassing Politics

Obtaining support for computer systems is no longer an ordeal wrapped in red tape.

By Mary S. Esparza
Assistant Editor

From mainframes and minis to micros and modems, Sorbus has had its hand in computer maintenance for more than 25 years.

Despite the increased reliability of today's computers, even the best equipment breaks down. Thus, service and support are becoming important in choosing a vendor. Companies that treat service as an afterthought are as obsolete as manual typewriters. Putting an end to the "who repairs what" syndrome, third-party support vendors provide service for most systems, including networks comprising multiple vendors.

According to D.R. Mike MacNaughton, Frost & Sullivan's project director for third-party maintenance activities, this is a critical time for the third-party maintenance (TPM) industry. Frost & Sullivan, New York City, is an international market research company that covers 12 different market areas including the computer industry. "Although [TPM] has weathered computer industry recessions and gained hundreds of new players, it continues to undergo major developmental changes and remains as turbulent as ever," he declares.

MacNaughton points out that manufacturers and maintainers have been forced to recognize TPM's impact on their markets. Consequently, they have had to change their service product offerings to meet the competition of self maintainers. He says we cannot ignore the colossal impact that mergers and acquisitions have had on this industry: Nearly all of the top 10 TPM companies have been affected.

The top five players in the industry are TRW, Sorbus, General Electric/RCA, Intelogic Trace and Control Data. Intelogic Trace was created from the spin off of Datapoint's service operations. Meanwhile, other companies like Memorex are expanding into the third-party arena. "Our expansion is getting deep into the systems 3X market," says Greg R. Grodhaus, Memorex vice president and general manager of the small systems group. "About 20 percent of our revenues come from service."

One reason companies turn to third-party maintenance contractors is cost. At Hitchcock Publishing Co., Wheaton, IL, the recent maintenance contract switch from the original manufacturer to third-party service turned out to be a significant cost savings. In March, Hitchcock signed a maintenance contract with Sorbus; the equipment was previously maintained by IBM.

"Sorbus is about 20 percent less expensive than IBM, and we fall under a master maintenance contract which offers an additional discount," explains Donald Hogan, vice president of information systems (IS) at Hitchcock. "This made it more attractive to us."

Hogan didn't look at other third-party maintenance firms because Sorbus was already servicing other sites for ABC Publishing, of whom Hitchcock is a subsidiary. "We had no misgivings about using [Sorbus]. This service was being used at a different site within the corporation," he says. "We asked about the service and Sorbus got very high marks."

At Hitchcock, Sorbus goes one step further than the original manufacturer by providing preventive maintenance. "They're pulling regular monthly preventive maintenance checks which IBM didn't do," says Hogan. "And the response time has been as good as IBM's."

Economically speaking, the move turned out to be wise, claims Hogan. "Sorbus is more flexible than IBM in cutting deals," he says.

Choosing a vendor. In the early stages of the TPM market, the principal criteria for choosing a vendor was ability to service mixed-vendor hardware. Around 1985 the top concern became the TPM vendor's reputation. During all of this time, however, TPM vendors have almost without exception marketed to prospective users principally on price.

These efforts have not gone unnoticed. Users now are convinced that price is the most important factor in choosing a TPM vendor, according to Input, a computer and communications industry market research firm, Mountain View, CA. In 1986 the significance of the vendor's reputation

Bypassing Politics

decreased in importance and concern, as did response time. Yet to emerge as a critical factor—but one that will be seen emerging swiftly as time goes by—is availability of total systems support to include software services, education and training, and systems upgrades and conversion.

In coming years equipment manufacturers will have an opportunity to put serious pressure on the TPM community by decreasing service prices and relying on low-margin, high-volume operations, claims Input. Similar to all retail-like markets, the TPM market will become a difficult place to survive in, according to Input. The share of the TPM market controlled by independent TPMs will decline from today's 80 percent to 65 percent in 1991, predicts Input. During that time, however, the distribution of that revenue will continue to be concentrated by mergers and acquisition activity that will eliminate many of the medium-size TPMs servicing the market today.

According to Input, the more than $2 billion market generates substantial profits and a lot of controversy. Input's review of the TPM market indicates that at any one moment more than 20 lawsuits are under process. Most aim at resolving disputes between TPMs and manufacturers as to the alleged nonavailability of spare parts, documentation and training on mainstream products.

Independent maintenance. There are almost 700 independent service companies in the nation, according to Bill Patch, vice president of marketing and planning for Sorbus, Frazer, PA. Patch has seen an increase in acceptance of independent maintenance companies among users. "We prefer to use the term independent maintenance company as opposed to third-party. It more accurately reflects our true positioning and what our offering is to a customer," he explains. "Third-party is almost a passe expression these days. It indicates there are three parties involved. Our approach is to be a single-source of support for a customer."

In most cases customers have more than one vendor's hardware, so there's really more than three parties involved, Patch points out. Typically, a customer has a very mixed bag of equipment. The key is that Sorbus is not interested in marketing hardware to the customer. "We're totally independent from any manufacturer and we feel that independent service companies is a more accurate description," he asserts.

In addition to cost and multiple vendor support, nationwide coverage is sought by firms when they enter a contract with a third-party vendor. The mergers that have taken place within the industry seem to be a plus where this is concerned. "More and more customers, both at large and medium-size firms have sites in different locations so they need national coverage," says Patch. "A lot of the acquisitions that are going on are regional companies being absorbed by national companies.

"And we're participating in that. It's a strategic method for growth in the business. Acquiring small companies is necessary for growth."

Covering both the Digital and IBM maintenance arena, Control Data offers a spectrum of services.

Mergers are a definite trend in this industry. "It's going to continue," Patch says. "In fact, over the long haul of, say, five years out, we believe that only people with national capabilities will be major players in the business."

Mergers haven't had any effect on Control Data's business, according to Gary Mertz, vice president of marketing for the Bloomington, MN, firm. "Acquisitions and mergers have had no bearing on the market that we're serving or the competition from other third-party maintainers," he says. "Our product offerings are still directed primarily at serving the DEC and IBM marketplace and also competing with them, more so than competing with the newly formed merging corporations."

Covering all equipment. User surveys and Sorbus' growth indicate an increasing appreciation for independent services. Success in the maintenance field is due largely to the need for someone who can work on various types of equipment, claims Patch. "Diagnosing where the problem is or isolating it to one particular piece of equipment can be a problem if there are different maintenance companies involved," he says. "The company that may have the CPU will come in and point a finger at the memory or the drives or the printer or whatever. Then the person who has the printer will come in and say, no, it's the CPU. We offer one source that covers all that equipment. That's basically what is driving the customers' requirement for one source for maintenance as opposed to many different vendors providing maintenance to a given site."

TPMs can be competitively priced. This is largely due to having no manufacturing overhead or research and development costs that original equipment manufacturer (OEM) service organizations absorb. "That enables us to offer different and flexible service offerings based on the customer's requirement, not on our requirement as a company to try to market more hardware to the customer," Patch says.

The Philadelphia Phillies turned to Sorbus when several of its maintenance contracts were expiring. Jeff D. Eisenberg, IS director, says the Phillies were not happy with the servicing prior to Sorbus, primarily in turnaround and quality. "We gave Sorbus a chance at bat and they hit a home run on the first pitch," he says.

To handle the growing volume of ticket transactions, the Phillies employ a computer system with a terminal network consisting of 21 Lear Siegler ADMs and 25 TeleVideo 950s. "Obviously, it's important that we get maximum uptime from the CRTs," says Eisenberg. Now instead of 15 days, the Phillies get repaired terminals back in fewer than five, he says, adding they are being fixed right the first time.

The switch to Sorbus resulted in a savings of $20 per unit for the Phillies on the annual maintenance contract. Eisenberg says he gladly would have continued to pay the additional money if it had meant better service. "I'm actually getting more service for less money with Sorbus," he says. "For us, Sorbus is batting a thousand."

Quality is key. As equipment is networked, its reliability becomes more crucial. Accordingly, every iteration of a product today has been more reliable. More critical applications run on the equipment. Ironically, at the

same time that reliability is increasing, the need for quality service once that equipment does experience a breakdown is increasing with it.

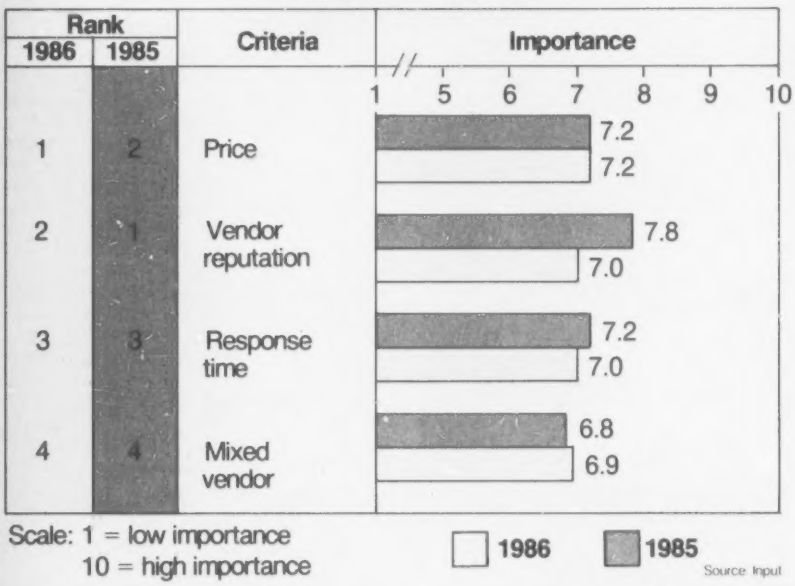
"We see a trend that puts emphasis on high quality of service and mainly availability of equipment," says Sorbus' Patch. "Someone running a data center is really a service function within their own organization. They've got a lot of people who have increasingly more important needs for that equipment. When equipment is down, that customer's main need is to be able to have that equipment available: to do what they want to do with it, when they want to do it."

No longer an afterthought. "Maintenance used to be an afterthought to a lot of people," states Patch. It would get added onto the contract right before the tax got calculated. People really didn't consider maintenance in a lot of their purchasing, he asserts. But this is changing. More users realize that availability is important. And that means having a quality service organization.

Networking demands high-quality maintenance, according to Patch. "One major trend that we're involved with is providing the idea of a single-source for maintenance: not just data processing equipment, but also telecommunications equipment. As these two become merged and PBXs start switching not only voice, but data, the same problem arises for a customer," he says.

Hardware is becoming more reliable, says Control Data's Mertz. Thus, there is less technical involvement on the part of the user organization. "The method of maintenance is becoming more exchange versus repair where it's down to the exchangeable unit within a mainframe," he says. "The type of service offered is modularized. In addition, networks are becoming a more predominant factor. The ability to service networks and multiple vendor's equipment are driving companies to a different mode of service.

Third-Party Maintenance Selection Criteria



"As you drive to new levels of service, investments are going to be made by the larger companies which can leverage that opportunity over a wider base of customers. A company like Control Data is positioned to take advantage of the investments we're going to be making, improving our breadth of product offerings and also our method of delivery of service. The trend is higher reliability."

While studies reveal that the critical mass for survival in the TPM industry has risen sharply, vendors remain optimistic about the future. Even so, analysts believe it is unlikely companies that do not have a national presence will have any significant long-term impact on the market.

"Some of the things going on within the third-party industry will have an effect on the future positions of a number of companies, primarily in the smaller end of the business, the regional and the local maintenance companies," says Mertz. "Technology is driving the maintainability of units to the point where it's becoming more difficult for the smaller or localized companies to really have a competitive advantage in the marketplace."

Mertz believes network maintenance is going to have a large impact in the industry. TPM vendors will not only have to perform maintenance on hardware but also diagnose failures and consult with the customer on the most advantageous configuration, he says. Software services, primarily in software consulting configuration, and performance analysis for the customer are going to be required, adds Mertz.

Image problem resolved. Users are apparently no longer skeptical of third-party service as a quality player in the industry. Not long ago, though, this attitude was at the opposite end of the spectrum. User attitudes today toward third-party are very good, according to Mertz. "If you had asked me the question three years ago, I'd say awareness of third-party was one of the issues that we were wrestling with," he says. "In the past two and a half years, the third-party market has made great strides in improving its image as a quality alternative to the OEM."

While Mertz believes users' reasons for choosing third-party service run in cycles, he declares there are three major reasons for the selection: quality, single point of service, and cost. "First of all, the third-party company must be able to demonstrate a quality of service. Otherwise it won't make any difference in our thinking what the price is or what features and advancements that you may have," he asserts. "You've got to be able to provide a quality level of service that offers a competitive advantage over the OEM. That means typically in today's environment being able to offer the customer more of a single-source solution: a single point of maintenance for the multivendor product which typically resides in any one computer site."

The service has to be cost-effective yet offer value for the money that the user is going to pay. "The customer is paying for the service, the customer deserves good service," Mertz asserts.

"In the past, maintenance has been a box service. If something broke, you called in the manufacturer to fix it. We believe the customer is going to require systems maintenance in the future. That means interaction of multiple vendors, effective in diagnosing of the equipment and so forth to solve the total solution for the customer," says Mertz. (15)

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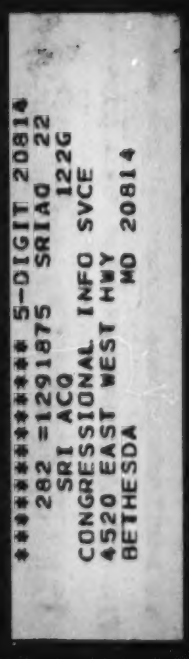
Disaster Recovery Planning Tools



IBM Takes on Digital • A CASE of Unknown Identity

Parallel Processing • DBMS and the 9370

VDT Picture Gets Blurry • Network Control Systems

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PO Box 337
Brookline, MA 02146, (617) 723-8970
1600 Woolsey St.
Berkeley, CA 94703, (415) 526-1320
Jan Snyders
PO Box 187
Lockport, IL 60441, (815) 485-8662

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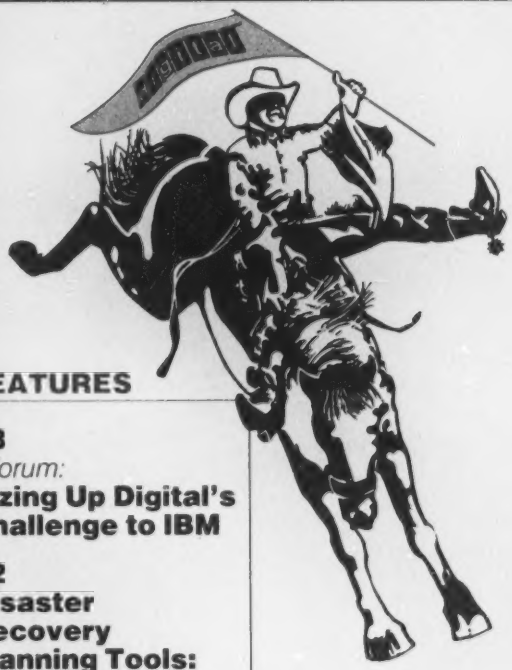

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Cover photo of burning building used courtesy of Comdisco Disaster Recovery Services, Rosemont, IL.

SNYDERS ON SOFTWARE

■ *By Jan Snyders, CSP Senior Editor Software*

The Changing World of Spreadsheets

Names may have changed, but mainframe software can still help the budget-weary manager achieve logic and accuracy.

I first wrote about spreadsheets for the mainframe in October 1984. What had been a one-vendor category that June had nine vendors by August. In the ensuing years the players have changed again: the nine have expanded to 11 and many of the names are new.

One spreadsheet I reported on came from Oxford Software in Hasbrouk Heights, NJ. Oxford was subsequently sold to Martin Marietta, who in turn sold it to On-Line Software in Fort Lee, NJ. The Mega Group (Irving, CA) sold its product to Computer Assoc., and Cincom Systems of Cincinnati dropped its offering. Despite this consolidation, several new players have taken the field, and some of the older ones have enhanced their products.

Business Model Systems, Westmont, IL, has spreadsheets designed specifically for the IBM Systems/36 and /38. *Minitplan/36* and *Minitplan/38* allow up to 10,000 worksheets in a model. Each can interact with an unlimited number of models. This facility, together with interworksheet calculations, allows logical organization.

Each worksheet can contain up to 10,000 rows and 97 columns. Data from Lotus *1-2-3* worksheets can be moved into *Minitplan/36* and */38* or vice versa. *Minitplan/36* has interfaces to *Display Write/36* (the IBM word processing system) and *Business Graphics/36. Minitplan/38* interfaces to *Office/38 Text Management* and *Office/38 Business Graphics.*

The *Minitplan* systems can access any file on a System/36 or /38 and selectively draw information into a worksheet. The user can have multiple interfaces so a worksheet can draw selectively from several files.

Referenced by name. Dynasoft in Rosemont, IL, says its *Dynaplan* spreadsheet is full functioned, combining the best features of *1-2-3* and other micro-based products with the advantages of mainframes. The command-selection menus, for example, resemble the *1-2-3* command selection process. A cell-pointing feature lets the user point to cells on the terminal's screen. The system also supports range names: Part of the spreadsheet may be referenced by a name rather than cell coordinates.

Dynaplan's basic spreadsheet includes a capability to sort parts of the worksheet on any number of keys. This is useful for applications that use the worksheet as a small relational data base. The system has capability for worksheets with up to 702 columns by 32,760 rows.

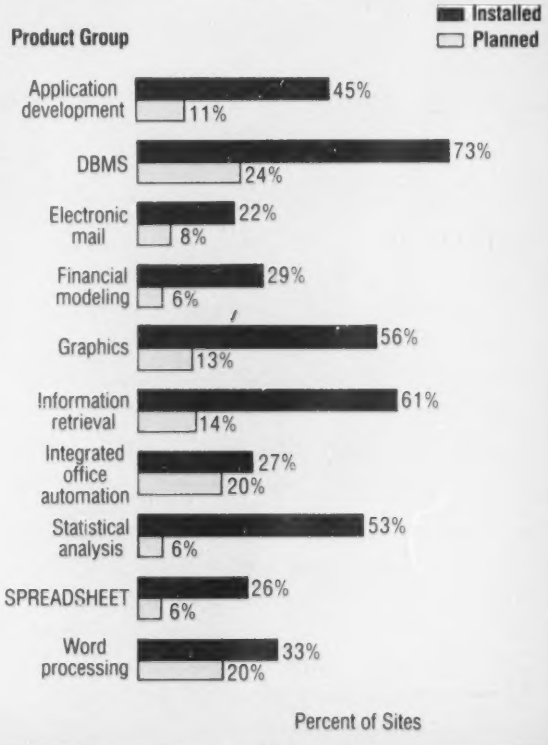
Worksheets are three-dimensional with up to 255 planes. This increases the ability to accommodate multiple departments. Each department's budget can be assigned to a separate page, or several related worksheets can be combined into a single three-dimensional structure. There is direct cell references between worksheets.

Standard commands. Boeing Computer Services, Seattle, WA, offers a system called *Boeing Calc.* The system works on IBM 370, 43XX, 30XX and compatibles as well as microcomputers. Using hard disk storage and virtual memory, the user can create spreadsheets with up to 16,000 rows, columns and pages. Using the same standard commands as *1-2-3*, existing *1-2-3* or *Symphony* files can be imported to the larger system. *Boeing Calc* can utilize user-defined menus to build macros.

Boeing Calc can also be used on a

Information Center Spreadsheets

Computer Intelligence, La Jolla, CA, surveyed over 600 IBM and plug-compatible mainframe sites with an implemented Information Center. Information was collected on both host mainframe and microcomputer systems used to support Information Center activities.



local area network. Each user can access the same spreadsheet simultaneously. The system provides security for each user down to the cell level. A system administrator matches task and security requirements to each user: Designated users can see but not change various parts of the spreadsheet; other portions can be hidden. Data can be consolidated from separate users onto a master page.

Trax Softworks' *ESS (Electronic Spread Sheet)* is a decision support tool that provides three-dimensional spreadsheets, Lotus compatibility and mainframe file access. In addition, it offers graphics support and macro processing for TSO (MVS and MVS/XA), CICS (DOS and MVS), VM/CMS and ADR/Roscoe systems.

ESS is compatible with Lotus *1-2-3* in two ways. It can read and write Lotus (Release 1A and 2) binary worksheet files, and applications that outgrow the micro can be uploaded. The *ESS* commands and prompts are similar to *1-2-3* so anyone familiar with Lotus can quickly learn *ESS*.

Written in Assembler to minimize central processing unit time, memory and disk storage requirements, *ESS* can handle one million rows by one million columns by one million pages. Installation involves one program, one module and no additional systems software. *ESS* can interface to IBM's DB2 and SQL/DS, and read any VSAM or sequential mainframe file.

Three-level protection. Sterling Software's Dylakor Div. (Chatsworth, CA) entered the applications software field with *Dyl-Calc*. The spreadsheet can be accessed by several users. Several spreadsheets can be viewed, edited and integrated on the same screen. Data can be extracted from virtually any mainframe data base or file. Three-level password protection is available, including protection at the spreadsheet level. Individual cells containing constants can be protected, allowing alteration of variables only.

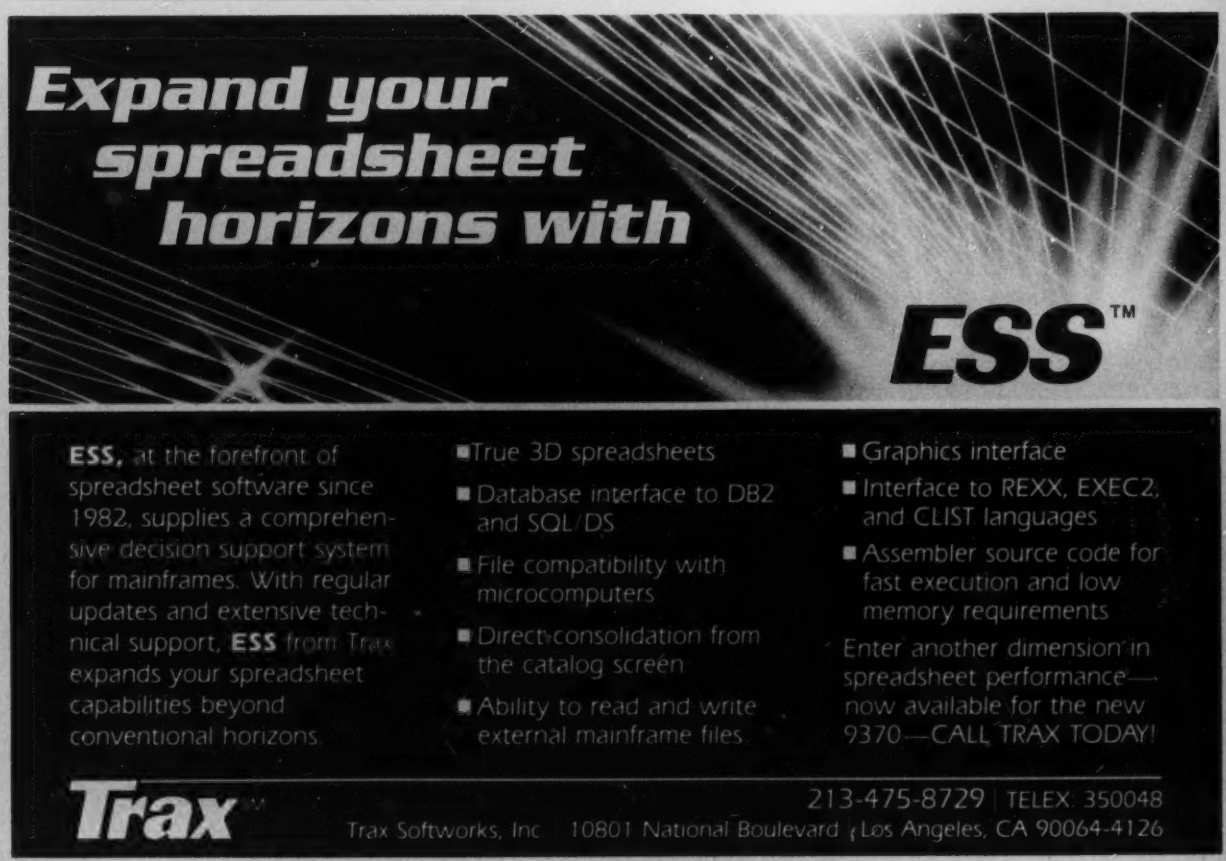
When introduced in March 1986, *Dyl-Calc* operated under either an MVS or DOS/VSE operating environment, requiring CICS or TSO under MVS. A VM/CMS version was announced this year.

Computer Assoc. (CA), Garden City, NY, entered the spreadsheet arena with its purchase of *Megacalc*. CA has made several changes, including changing the name of the product to *SuperCalc/MF* to more accurately portray the relation between its microcomputer and mainframe spreadsheet products. *SuperCalc/MF* is designed to access corporate data from data bases, financial systems, spreadsheets, sequential files and VSAM files. Data base files can be accessed from within *SuperCalc/MF*, ensuring as current and accurate data as possible.

The system can import microcomputer spreadsheet fields for central consolidation of data. It enables users to consolidate files created with microcomputer spreadsheets such as *SuperCalc4* and *1-2-3*.

In addition to the change in product name, CA announced a *SuperCalc/MF* interface to IBM's DB2 data base. The DB2 interface provides simple access to IBM-mainframe DB2 files from within *SuperCalc/MF*. It is designed to function in the MVS operating environment. (IS)

For a list of mainframe spreadsheet software vendors and their products enter No. 11 on the Reader Information Card.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